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FEBRUARY, 1922

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MINNESOTA MEDICINE

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VOL. V FEBRUARY, 1922 No. 2

ORIGINAL ARTICLES

THE GALLBLADDER AS A FOCUS OF INFECTION*

BERTRAM S. ADAMS, M. D. F. A. C. S.
Hibbing, Minn.

That the gallbladder is a frequent source of focal infection is quite commonly known; yet, in looking up the literature on the subject one is surprised at its paucity. The teeth and tonsils, sinuses and eyes, and even the genito-urinary organs are recognized as frequent sources of infection by an abundance of literature. Yet the gallbladder is so often a source of focal infection that it warrants further recognition. The diseased gallbladder makes an excellent site for focal infection; it is filled with a purulent bile teaming with bacteria; its walls and mucous membrane are congested and inflamed and full of germs; the bile is often stagnant and very slow in being discharged on account of congestion of the cystic and common ducts as well as stones; it thus becomes a fruitful source from which infection and toxins are scattered throughout the body by the blood and lympathic vessels. Lapenta says, "It is very easy in our consideration of the etiological causes of gallbladder lesions to underestimate the importance of chronic infections processes in these structures as focal infection factors capable of multifarious clinical manifestations. Thus we have seen numerous cases of chronic pancreatitis to be wholly dependent upon subinfection maintained by disease of the gallbladder. Cures have been symptomatically obtained in these cases by cholecystectomy".

Among the organs that are known to be affected as a result of gallbladder disease are the liver, pancreas, heart, colon, and nerves as well as anemias and various rheumatic affections. Judd and Mann have shown by recent experiments that the pancreatitis frequently found in gallbladder operations is due to infection carried to the pancreas from the diseased gallbladder by the lymphatic vessels rather than through the common duct and pancreatic duct. Hepatitis is frequently caused by the infected gallbladder in a similar manner. Sir Humphrey Rolleston says, "It is now recognized that glycosuria or diabetes, if indeed any real distinction between them should be drawn, may be due to pancreatitis set up by infection associated with gallstones . . . The surgical treatment of certain cases of diabetes practiced by Sir A. W. Mayo-Robson is an illustration of preventive surgery as it aims as the removal of the cause before the resulting pancreatitis has reached an extensive stage."

The heart and vascular organs are sometimes affected by gallbladder infection in a serious manner. Rolleston says, "The dyspepsias due to appendix or gallbladder disease may be associated with heart palpitation, irregularity, and substernal distress. M. J. Lichty found that in appendix cases the cardiac disturbance was usually functional only, whereas in gallbladder disease either alone or combined with appendicitis the resulting cardiac disease was more serious. Absorption of toxins from an inflamed gallbladder or ducts may cause myocarditis, anginoid symptoms, and cardiac failure; in a paper or chronic cholecystitis as a cause of myocardial incompetence, Babcock records thirteen cases, medical advise being sought, with two exceptions in which biliary colic occurred, for cardiac disorder without any suspicions of gallbladder trouble. Angina or aginoid symptoms in patients with gallbladder disease may be due to exhaustion of the poisoned myocardium. An especially interest-

*Presented before the Minnesota State Medical Association, Duluth, Minn., August 1921.

ing case as it raises the question of Graves disease as a result of gallbladder infection is reported by Sears; a woman had an intense precordial pain spreading to the left shoulder, a raised pulse rate, and enlarged thyroid, and other symptoms suggesting Graves disease. An attack of biliary colic lead to operation and removal of two gallstones, and disappearance of all symptoms. Babcock describes a group of his cases in which attacks of angina preceded cardiac failure. The pain of biliary colic sometimes imitates angina and cases in which attacks of angina have cleared up after frank biliary colic are on record. . . . The symptoms of existing valvular disease may be intensified or compensation may be broken down by toxic myocarditis due to gallbladder infection. It is important to remember this and also that the cardiac weakness is often entirely due to gallbladder disease and will be cured by surgical treatment." Lapenta mentions as a result of gallbladder disease a secondary anemia of a severe type resisting all medical treatment but which was quickly relieved after cholecystectomy. These cases while more frequent when associated with common duct stones were also present in simple cholecystitis. These cases he says, "must not be confused with a hemolytic icterus. They represent a type of secondary anemia due to increased fragility of erythrocytes which is encountered after all chronic infections."

Colitis with prolonged and exhausting diarrhea is another infection sometimes caused by a diseased gallbladder and the cause of which is often very difficult to diagnose. These cases do not clear up usually until a correct diagnosis has been made and the offending organ removed or drained. In these cases the appendix is usually associated with the gallbladder. Another disease resulting from gallbladder infection is carcinoma of the gallbladder and liver, as a late result of prolonged chronic inflamation of the bilary tract. While the direct cause of carcinoma is unknown, evidence points to chronic prolonged inflammation or irritation as being an important factor.

I wish to give three case histories as illustrations of focal infection from the gallbladder.

Case No. I. Mrs. A. W., aged 49, married, American. Has had six babies and two miscarriages—last pregnancy occurring eleven years before. Family history negative. She came to me in November 1918 complaining of a typical sciatic pain in her right leg. This pain had started in August 1918, and was located in the back part of right thigh extending from buttocks down the thigh to below the knee; pain was worse in the morning, and while easier in the afternoon did not entirely disappear at any time. She gave a history of slight attacks of pain over the appendix region for many years; had had attacks of vomiting and biliousness some years before, which were especially bad after menstruation. At the time the pain started in her right thigh she also had some pain in her right shoulder. Examination showed no abscessed teeth, healthy appearing tonsils; heart, lungs, kidneys, and pelvic organs negative. Wassermann test negative. Examination of thigh, leg and back showed nothing. On abdominal examination there was marked tenderness over McBurney's point and some muscular rigidity. There was also present tenderness and rigidity in upper right quadrant of abdomen but to a lesser degree. Operation was advised but refused, and medical treatment tried. After several weeks of medical treatment the pains in her leg became so severe and continuous that she was willing to try anything to get relief. On January 2, 1919, operation showed a chronic appendix buried in adhesions, and a gallbladder containing a stone one half inch in diameter. Both appendix and gallbladder were removed, and convalescence was normal. Before leaving the hospital the pain in her leg had entirely disappeared and she has had no recurrence.

Case No. II. Mrs. D. S. P. American, aged 37, married, had three children, no miscarriage, family history negative. She came to me in May 1919 on account of sciatic pain in right thigh which was increasing severely all the time and making it difficult for her to do her work. History showed she had some lung trouble about twenty years before—possibly a beginning of T. B. Ten years before she had typhoid fever and was very sick. Since that time she has been troubled repeatedly with attacks of pain in the right lower abdomen. The pain in her right leg had started one year before but had not been severe until lately. Examination showed negative teeth and throat; heart normal; lungs showed no active trouble; urine negative; pelvic organs negative. Examination of the back and leg showed nothing. Abdominal examination showed marked tenderness over McBurney's point, and a slight tenderness over gallbladder. No marked muscular rigidity. Barium meal showed no filling defect but an immobile cecum and marked tenderness over the appendix. Diagnosis was sciatica due to chronic appendicitis. Operation showed a chronic appendix which was removed. No gallstones could be felt either in the gallbladder or ducts though there were a few adhesions about the gallbladder; it was not markedly inflammed so we did not remove it. During convalescence the

pain in her leg was not as severe as before but did not cease. After her return home the pain in her leg increased and caused her a great deal of trouble during the next several months. Removal of the gallbladder was advised but she refused to have it done. At the present time she has no pain in her leg unless she becomes over tired or has been on her feet a good deal. But she still has a good deal of indigestion and stomach distress. I believe I made a mistake in not removing the gallbladder at the time of the appendix operation and that its removal would have cleared up the sciatica entirely.

Case No. III. Mrs. A. A. B. American, aged 29, married three years, never pregnant. Came to me on account of severe pains in the middle of her back, extending down across the sacro-illiac region, and down the back of right thigh and leg to heel. This pain started in the lower half of her back about four years ago while she was teaching. Eight or nine months later she had an attack of pain in the right side of the abdomen just below the ribs and her doctor thought she had an abscess of the neck of the gallbladder; electric treatment and diet were prescribed and after several weeks the pain in her abdomen stopped. The backache continued intermittently. During the past year the backache has been increasing and becoming much more constant and with it has come the pain extending down the back of her leg from the buttocks to the heel. These pains become worse after work or exertion and at times she says they are almost unbearable. These attacks of pain come on about once a month and last about a week, but have no relationhip to her menstrual periods and apparently are not associated with menstruation, the latter being regular and painless. Family history negative; she had a severe attack of measles during infancy, and three years ago she had tracheitis with frontal sinus infection. This cleared up after the frontal sinus was drained through the nose and she suffered no more from that. Her teeth are perfect and tonsils small and contain no apparent infection. Pelvic examination negative. Stomach roentgen ray was negative. Abdominal examination showed a slight tenderness over McBurney's point and a very marked tenderness over the gallbladder; muscles of the right side of the abdomen showed a very decided rigidity and especially so in the upper quadrant. Examination of the back was negative. Wassermann test negative. Operation October 8, 1920, showed a chronically inflamed appendix which was removed. The gallbladder contained no stones but was decidedly inflammed and injected and was removed. Laboratory report showed marked inflammatory process of appendix and gallbladder tissues. Convalescence was normal. Relief from pain in the leg was almost immediate. The pain in the back continued for several weeks but gradually decreased in severity and since the first of the year she has had no pain whatever and is now feeling better than she ever did.

In conclusion I would add a word of warning—don't blame the gallbladder for too much nor too often. But there are undoubtedly some cases in which the galbladder is a source of focal infection; in these cases operation will give decided relief.

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THE ETIOLOGY AND LABORATORY DIAGNOSIS OF ACTINOMYCOSIS*

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Actinomycosis is classified among the rarer of the infectious diseases. When a review of the mass of literature on the subject is attempted, however, it appears that the disease is either gradually increasing, or, as is true in other conditions, keener observation has brought about keener diagnoses, so that actinomycetes in man is not an uncommon finding.

The most notable collection of cases that has been reported in this country is that of Ruhrah, who collected sixty-nine cases reported in the United States up to 1900. One of the early important studies of the bacteriology of *Actinomyces bovis* is that by Wright.

The classification of actinomycetes bacteriologically has been the subject of considerable controversy. This is due to the fact that much confusion has arisen in this disease, as in other mycoses, from the inaccuracy of synonyms and the meager description of organisms reported by individual workers. A few attempts have been made to clear up this confusion by careful studies of the group, and of the biologic characteristics of various species. Breed and Conn, in a study of the nomenclature of Actino-

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mycetaceae, have recommended to the Committee on Characterization and Classification appointed by the Society of American Bacteriologists that two genera be recognized in the family, Actinomyces, with *Actinomyces bovis* Harz as the type species, and Nocardia with no type species named. The first genus is intended to include the anaerobic pathogenic types, and the second to include aerobic species, primarily saprophytic in nature. Breed and Conn have in addenda to this report taken exception to a report by Merrill and Wade that appeared simultaneously with their first paper contending that Discomyces Rivolta is the correct term to use. Although Discomyces Rivolta has priority, Actinomyces Harz is given the place of preference through usage. This has been accepted by the Society of American Bacteriologists and the term Actinomyces has been added to their list of approved genera.

In our selection of cases in the American literature and in the Mayo Clinic series we have discarded cases of infection with acid-fast aerobic organisms as we believed that these should properly belong to the genus Nocardia, and have restricted ourselves to those cases which have been infected with the "ray fungus" or the actinomyces of the bovis type. As a criterion for this standpoint we have the work of Wright and of several others, who have made more recent studies of the bacteriologic characteristics of the disease.

Colebrook, in England, has recently reported a very careful study of actinomycosis in man. He isolated twenty-one strains of actinomyces of undoubtedly the same group. Two strains were evidently of a different group, and one strain was frankly different from the common type. In all, twenty-seven strains of actinomyces were isolated in twenty-eight cases. This is a remarkable result inasmuch as the cultivation of *Actinomyces bovis* is by no mean a simple bacteriologic procedure. The chief point in the cultural characteristics of all strains that are true to type is the strong preference for anaerobic growth, although some strains become capable of aerobic growth if subcultured in broth under a column of liquid paraffin. Glucose is usually necessary for a luxuriant growth of the primary culture. The optimum hydrogen ion concentration is from 7.3 to 7.6. The viability of actinomycetes is slight. They are killed by exposure to 60° C for one hour, and surface cultures are reported by Colebrook as being sensitive to desiccation. Frequent subcultures tend to kill the strain. They are best kept alive in the ice box when cultivated on egg mediums and when kept moist.

Many divergent views are reported in the literature with regard to the source of infection. We shall not attempt to enter into this controversy. There are a few points of interest, however, in the various theories that have been presented. One of the most common ideas is that the ray fungus is conveyed to man from vegetable sources. Injuries with barley beards or the hard portion of grains or grasses, especially around the mouth, are commonly considered the sources of infection. The instances in which such injuries are reported in the literature are too numerous to mention short of a complete review of the history of actinomycosis. Colebrook, however, has called attention to the fact that there may be some skepticism regarding this view as the common organism which is found on vegetable sources is an aerobic fungus which does not usually conform bacterologically to the type species which is used to describe the group. The anaerobic organism of the type *Actinomyces bovis* has not been demonstrated unquestionably in natural sources outside the animal body.

Another view that is gaining ground is that the organism is a natural inhabitant of the alimentary tract and that on certain occasions it is carried into the tissues and appears to establish itself there. There are two cases in the literature, one in England (Cope) and one in America (Mc Williams) of actinomycosis of the finger resulting from injury inflicted by an opponent's tooth in a fist fight. In both of these cases the inference is that actinomyces was present in the oral cavity of a person who was not suffering from the clinical manifestations of actinomycosis and that the spores were carried into the tissues through the injury to the finger. Lord, several years ago, demonstrated in carious teeth and tonsillar crypts of normal persons organisms morphologically and tinctorially identical with *Actinomyces bovis*.

He was able to produce lesions in small animals by inoculation with the organisms which contained typical clumps of ray fungi. The question of the transference of actinomycetes from animal to man or from man to man has been raised by many writers, but direct proof of this form of transference has not been demonstrated satisfactorily. Indeed, when all the evidence is weighed the true method of infection has not as yet been clearly proved.

Fig. 1. (Case 34271). Sulphur bodies.

LABORATORY METHODS OF DIAGNOSIS

The chief diagnostic finding in actinomycosis is the presence of so-called sulphur bodies in the pus. These are macroscopic, and characteristic. While organized bodies in various pathologic conditions may, to a certain extent, simulate the actinomyces granule, the alert observer will be almost sure of his diagnosis when he spies one of the light yellow bodies being carried out in the pus of a discharging sinus (Fig. 1). In the preparation of slides for demonstrating the ray fungus we have found it convenient to use some fluid, either ordinary distilled water, or 20 per cent potassium hydroxid solution, to wash the pus cells away from the granules. This procedure is carried out on the microscope slide. The granule is then crushed with a cover slip and examined at once with the low power of the microscope when the characteristic daisy formation is easily recognized (Fig. 2).

Clumps of inspissated pus have been mistaken grossly for sulphur bodies. However, such material is easily teased out in the distilled water on the microscope slide and disintegrated when a cover slip is placed over it, while the actinomyces granule is so well organized and matted together that sometimes considerable pressure is necessary in order to press it out for examination. The difference in refractivity between the colony and the surrounding material on the slide is very characteristic. When stained preparations are desired the pus is fixed on the microscope slide in the usual manner and stained with Gram's stain. The mycelia are gram-positive while the clumps are more apt to be stained with the counter stain. The filaments on an average are from 10 to 12 microns long, the clumps from 20 to 30 microns long and 8 to 10 microns broad.

The diagnosis of actinomycosis by culture is attended with some difficulty since *Actinomyces bovis* does not grow readily, even under anaerobic conditions. If many cultures are made it is possible to obtain growth from a small percentage of the sulphur bodies that are inoculated deep in the melted agar tubes (Fig. 3). Glucose is usually necessary for growth. We

Fig. 2. Crushed actinomyces granule.

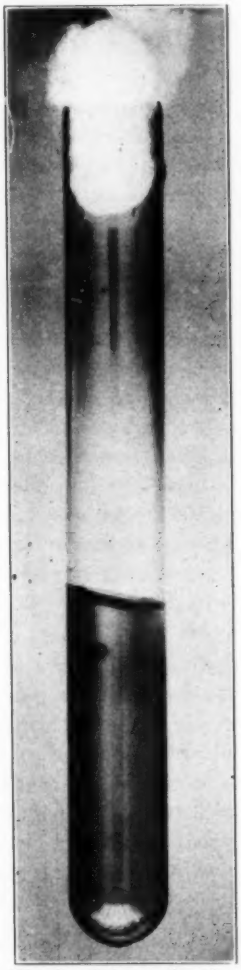

Fig. 3. Colony of actinomyces in glucose agar.

have had little success in subculturing primary culture.

Colebrook, who has met with so much success in England in isolating *Actinomyces bovis*, also reported the presence of peculiar accompanying bacilli in all of his cultures that he has called *Bacillus actinomycetum comitans*. It will be interesting in the future to note whether this organism is reported as a common symbiotic organism with *Actinomyces bovis*.

The pathologic examination of the tissue in a carefully prepared specimen will reveal the characteristics ray fungus (Fig. 4). These are best demonstrated with the Gram-Weigert stain.

In discussing the laboratory diagnosis of actinomycosis mention might be made of the value of roentgenography. There is practically no positive value in this form of examination in the ordinary case of actinomycosis since actinomyces does not involve bony structures. However in actinomycosis of the lung the shadow might reveal the location of a collection of pus. If ray fungi have been demonstrated in the sputum this will be of assistance to the surgeon in his operative procedures.

As a further study of *Actinomyces bovis* serologic tests might be mentioned. Colebrook has reported his observations on agglutinability and agglutinogenic properties of *Actinomyces bovis*, and calls attention to the fact that little is known on the subject. He states that patients heavily infected usually give coarse agglutination with his suspension of *Actinomyces bovis* dilution of 1:500 to 1:4,000, a slight infection of the cervicofacial type failing to show agglutination. Similar coarse agglutination was obtained with serums from rabbits inoculated with a vaccine of *Actinomyces bovis*. It has not been demonstrated whether there are several serologic types of *Actinomyces bovis*. We are also interested in whether pure cultures of this organism may be used as antigens to demonstrate complement fixing bodies in infected individuals, and have planned some investigations of this nature. The possibilities of serology as a means of confirming diagnosis are suggested, although our interest in this subject is chiefly from the experimental standpoint.

We are attempting to review the voluminous literature on actinomycosis, but we believe that it is not feasible to discuss, in this paper, reported cases in detail. We do believe, however, that for the convenience of future workers all the cases reported in the United States should be collected. We shall report these in another paper, and shall refer here to 119 cases only that are reported to have occurred in the United States. The etiologic factors of these will be compared with the etiologic factors seen in the cases in the Mayo Clinic. Cases of actinomycosis of the head and neck that have been observed in the Clinic are being studied by New. New and Figi have reported three cases of actinomycosis of the tongue. Brogden has collected fourteen cases of intestinal actinomycosis diagnosed at the Clinic, and his report is ready for publication. Moersch is interested in infection of the nervous system with *Actinomyces bovis* and is about to report three cases that have been seen at the Clinic. Consequently the disease will not be considered from a clinical standpoint in this paper, nor do we attempt to discuss methods of treatment.

The first diagnosis of actinomycosis in the Clinic was made in 1909. Since then, ninety-six cases have been diagnosed. The basis for the diagnosis in each case has been either demonstration of typical sulphur bodies in the pus coming from the lesion or the demonstration of actinomyces in the tissue by the pathologist. In many instances both criteria have been used for the diagnosis. On the whole each year

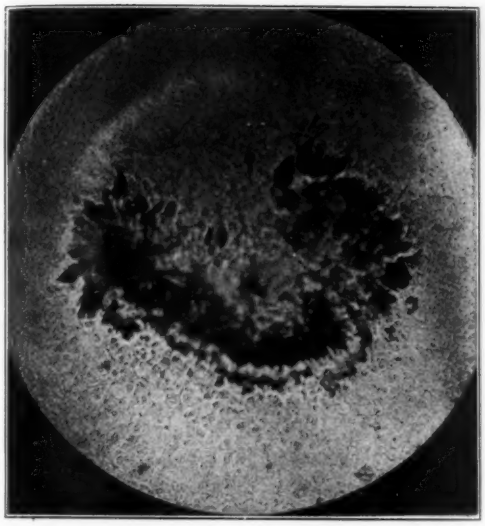

Fig. 4. (Case 210659). Actinomyces in tissue, showing mycelia and clubs.

shows more cases of actinomycosis than the preceding year, although this should not be construed to be an intimation that actinomycosis is increasing.

Actinomycosis is primarily a disease of the male. Eighty-four of our ninety-six cases were in males. Of the 119 cases collected in which the sex is stated, seventy-nine were in males. Thus it may be concluded that about 80 per cent of the cases occur in males. The reason for this is perhaps evident when suggested modes of infection are taken into account. If it is granted that the common mode of infection is from chewing or ingesting contaminated grass or straw, which is in reality a habit of outdoor life, it is obvious that the male is more often exposed than the female. Likewise, if infection occurs through contact with infected cattle, the male is more often exposed than the female. Quite often the females infected are wives of farmers, who possibly share with their husbands the outdoor life of the farm. It is also true that men are more prone than women to neglect the care of the mouth.

The distribution by age is striking. In our series of cases the large majority have occurred between the ages of twenty-five and forty-five years. The age incidence was practically the same in the 119 cases collected, so that it may be stated that actinomycosis is primarily a disease of middle life. This may be discounted, however, by the fact that persons are most active in outdoor life at this age and may come in contact more often with the source of infection. No age seems to be exempt; in our series were patients of nine and of seventy-one years (Table 1).

TABLE 1

NINETY-SIX CASES OF ACTINOMYCOSIS IN THE MAYO CLINIC

Distribution by ages

Years	Cases
1 - 10	2
11 - 20	10
21 - 30	25
31 - 40	20
41 - 50	22
51 - 60	12
61 - 70	4
71 - 80	1

That occupation is a factor in the etiology of actinomycosis is quite evident, and has been noted by previous writers. In our series of ninety-six cases fifty-seven were in farmers (Table 2). In the 119 cases collected from the literature sixteen were in farmers (Table 3), but it should be stated that the occupation was not noted in one-fourth of the cases reported. It is likely that in this series, as in ours, infection among farmers predominates. The disease is noted also in stock buyers, ranchmen, stock raisers, leather cutters, and various men who come in contact with farm life and cattle. This again raises the interesting question with regard to the mode of infection. If it is through contact with contaminated cattle it is obvious that these men are more often exposed than any other group of persons. However, in many instances the patient had never come in contact with cattle either infected or not infected. If the infection is obtained from the bearded grasses the explanation of the predominance of the disease in farmers is obvious and of the occurrence of the disease in persons of various occupations who undoubtedly at some time in their lives come in contact with grasses. It is apparent from the long list of occupations of the patients with actinomycosis that association with the animal industry is not necessary to the infection.

It is difficult to draw conclusions concerning

TABLE 2

NINETY-SIX CASES OF ACTINOMYCOSIS IN THE MAYO CLINIC

Distribution by occupations

Barber	1
Bookkeeper	1
Carpenter	2
Druggist	1
Engineer	1
Farmer	57
Farm implement dealer	1
Housewife	12
Justice (Court of Appeals)	1
Laborer	5
Leather cutter	1
Machinist	1
Meat cutter	1
Merchant	1
Minister	1
Not known	1
Plumber	1
Rancher	1
Stock buyer	1
Stone cutter	1
Stock raiser	1
Telegraph operator	1
Tile mill worker	1

TABLE 3

ONE HUNDRED NINETEEN CASES OF ACTINOMYCOSIS COLLECTED FROM THE LITERATURE

Distribution by occupation

Butcher	1
Camp worker	1
Carpenter	3
Cattle dealer	1
Cattle raiser	2
Clerk	4
Coachmen	1
Conductor	1
Civil service man	1
Dairy maid	1
Drover	1
Factory hand	1
Farmer	16
Furrier	1
Housewife	9
Houseworker	1
Jeweler	1
Laborer	3
Laundryman	1
Lawyer	2
Machinist	2
Merchant	4
Miner	1
Operator	1
Photographer	1
Physician	1
Rigger	1
School boy	2
School girl	4
Section hand	1
Servant	1
Soda-water manufacturer	1
Stableman	1
Steam-boat captain	2
Stone mason	1
Teamster	1
Not stated	42

the distribution by states, because many factors are involved in reported cases. A patient may become infected in a different state from that in which he is resident, or the clientele of the physician who reports the case in a large measure determines the number of cases that are reported from a given state. In our series of cases most of the patients came from the middlewest and northwest states, (Table 4). These are, of course, the great cattle raising and farming states of the United States. It is interesting to note that few if any cases of actinomycosis are found among the many patients who come to us from the South and Atlantic coast and from the far West. In the collected cases New York leads with twenty-eight of 119 cases in which the residence is stated (Table 5). Several explanations may be offered for this. New York is a city of immigrants and many of these cases may be imported. It is not always clear from the reports that the disease had been contracted in New York state. Nineteen cases of the 119 were reported from Illinois; with those from Iowa, Wisconsin, and North Dakota, all middle western states, they constitute a large percentage of the remaining cases. Fifteen cases are reported from Massachusetts. Most of these were from the Massachusetts General Hospital, in which also it is not always possible to determine where the infection was obtained. The impression is, however, that actinomycosis is far more prevalent in the middlewest and northwest states than in any other part of the United States, even making allowance for the fact that many cases diagnosed are not reported, and many cases are not diagnosed. This fact is even more forcibly brought home by an examination of the record for 1920 of the Federal Meat Inspection Commission of the United States Government (Table 6); the number of cattle retained on

TABLE 4

NINETY-SIX CASES OF ACTINOMYCOSIS IN THE MAYO CLINIC

Distribution by states (United States) and provinces (Canada)

Alberta	7
Illinois	2
Indiana	5
Iowa	11
Kansas	1
Michigan	2
Minnesota	7
Missouri	5
Montana	12
Nebraska	4
North Dakota	6
Ohio	2
Oklahoma	1
Ontario	1
Oregon	1
Saskatchewan	9
South Dakota	12
Texas	1
Washington	2
Wisconsin	5

TABLE 5

ONE HUNDRED NINETEEN CASES OF ACTINOMYCOSIS COLLECTED FROM THE LITERATURE

Distribution by states (United States)

Alabama	1
California	2
Colorado	1
Illinois	19
Indiana	1
Iowa	9
Kansas	1
Kentucky	1
Maryland	6
Massachusetts	15
Michigan	1
Minnesota	3
Missouri	1
New Jersey	2
New York	28
North Dakota	6
Ohio	3
Pennsylvania	4
Rhode Island	1
Tennessee	1
Virginia	1
Wisconsin	4
Not stated	8

account of actinomycosis indicates that the disease is encountered much more commonly in the middlewest slaughter houses than in other regions of the country. Not only is this true in absolute numbers, but also relatively. Absolute conclusions cannot be drawn from this table because the source of the cattle in each instance is not known. As a general rule, however, cattle are not shipped farther than is necessary for good market conditions, and thus most of the cattle in the middlewest slaughter houses are from the middlewest, while in the slaughter houses in the south and east are eastern and southern cattle. Etiologically these facts may be interpreted in two ways; that the most infection among cattle results in most infection among man through direct contact, or that actinomyces is present in nature more in the west than in the east, and men and cattle are more often exposed. The result in either case would be the same.

In a letter from one of the physicians connected with a large packing plant in Chicago he states:

"It has been our observation that the so-called western grass-fed cattle from such states as Montana, New Mexico, Arizona, Texas, Kansas, North Dakota, South Dakota, Wyoming, Utah, Colorado, and parts of Nebraska, are more frequently affected with actinomycosis than those that are fed on corn in Illinois, Wisconsin, Iowa, and Indiana. We are quite sure that this has been the experience in the packing industry in general."

This physician further suggests that it may be that because range-fed cattle remain outdoors nearly the entire year, travel in herds, are wilder, and are subject to injury around the jaws in fights or by wire fences that they are more susceptible to the natural source of infection.

The distribution of the disease according to anatomic location, and to the duration of symptoms in the cases in the Mayo Clinic is shown in (Table 7). From this it will be seen that lesions in the head and neck occur nearly twice as often as in other parts of the body. Next in number are the cases of the appendix and cecum. However, almost any part of the body may be involved. In general, the same may be said concerning the cases collected from the literature (Table 8). The conclusion is inevitable that the alimentary tract plays a very important part in the source of infection. This

TABLE 6

ACTINOMYCOSIS IN CATTLE—FEDERAL MEAT INSPECTION REPORT, 1920

	Cattle killed	Cattle retained for actinomycosis
Augusta, Ga.	5,255	0
Baltimore, Md.	94,953	429
Boise, Idaho	1,902	11
Boston, Mass.	77,346	191
Brooklyn, N. Y.	59,279	211
Buffalo, N. Y.	115,609	694
Burlington, Vt.	4,194	0
Chicago, Ill.	2,155,913	40,401
Cincinnati, O.	181,059	1,205
Cleveland, O.	128,377	513
Dayton, O.	14,004	24
Denver, Colo.	120,127	3,739
Detroit, Mich.	70,931	421
Dubuque, Ia.	7,904	29
Fort Worth, Tex.	391,609	6,373
Haverhill, Mass.	1,176	0
Indianapolis, Ind.	195,672	1,261
Jersey City, N. J.	75,292	980
Kansas City, Kans.	1,214,480	30,749
Lewiston, Idaho	1,263	13
Los Angeles, Calif.	115,154	341
Louisville, Ky.	15,396	58
Milwaukee, Wis.	106,539	460
National Yards, Ill.	587,763	6,875
Newark, N. J.	22,599	76
New Orleans, La.	70,923	131
New York, N. Y.	433,228	4,314
Oklahoma, Okla.	264,829	1,498
Omaha, Nebr.	938,147	19,271
Paterson, N. J.	1,605	9
Peoria, Ill.	12,638	52
Philadelphia, Pa.	104,204	263
Pittsburgh, Pa.	55,221	460
Portland, Ore.	39,308	113
Richmond, Va.	9,226	33
St. Louis, Mo.	194,039	1,475
San Diego, Calif.	9,325	648
San Francisco, Calif.	64,355	149
Seattle, Wash.	54,855	718
Sioux City, Ia.	310,813	15,228
So. St. Joseph, Mo.	412,305	7,503
So. St. Paul, Minn.	301,958	14,883
Spokane, Wash.	30,598	277
Toledo, O.	1,985	0
Washington, D. C.	13,437	19
Wheeling, W. Va.	14,058	25
Wichita, Kans.	18,574	931
Entire Country	9,709,819	176,456

is striking in the details of the case histories in almost all of which a tooth or tonsillar trouble immediately preceding the onset of the disease is mentioned. Immediately following extraction of a tooth the lesion appears in the region of the jaw or submaxillary gland. The duration of symptoms before the patient presents himself is, contrary to the usually accepted idea, rather short. In six cases of our ninety-six the history was under one month; in two of these only ten days had elapsed after choking over a barley beard before the lesion appeared. Practically all patients with lesions of the head and neck presented themselves within twelve months and most of them within six months. The period of symptoms was practically the same in the other cases. However, the majority of the patients with actinomycosis of the cecum and appendix presented themselves after from one to five years. Evidently the disease is usually acute or subacute, except in the cecum and appendix, where it is chronic. The incubation period is very difficult to determine because it is almost impossible to obtain a history of definite injury, or inoculation.

In conclusion we wish to emphasize that

TABLE 7

CASES OF ACTINOMYCOSIS IN THE MAYO CLINIC

Anatomic distribution and duration of symptoms

	Less than one month	One to six months	Six to twelve months	One to five years	Five years and more	Unknown	Total
Abdominal wall	..	1	1		1	..	3
Appendix	..	2	3	8	1	..	14
Chest	..	2	..	..	..	..	2
Epigastrium (liver?)	..	..	..	..	1	..	1
General	..	..	..	1	..	..	1
Head and neck	4	34	18	3	1	1	61
Liver	..	..	1	..	..	..	1
Liver and breast	..	..	..	1		..	1
Lung	..	..	1	..	1	..	2
Lung and neck	..	..	1	..	..	..	1
Mediastinum	..	1	..	..	..	..	1
Parotid gland and spinal cord	..	1	..	..	..	..	1
Scrotum	..	1	..	..	..	..	1
Temporal region, spinal cord, and lung	..	1	..	..	..	..	1
Testicle	..	..	1	..	..	..	1
Thigh	..	1	..	..	..	..	1
Tongue	2	1	..	..	..	..	3
	6	45	26	13	5	1	96

actinomycosis, while an uncommon disease, is not so rare as many imagine. In a patient with an acute or subacute infection of the cervicofacial region, especially if there has been dental trouble on the affected side, or a history of definite injury, this disease must be suspected. A differential diagnosis must also be made in those types of abdominal lesions in which a sinus persists after drainage of an abscess. The careful examination of the discharge in either type of case for characteristic sulphur bodies will lead to the correct diagnosis clinically, which is readily substantiated by simple laboratory procedures.

While the biologic characteristics of the causative organism and its place in the vegetable world has been defined, the etiologic factors concerned in the production of infection in man or beast are not known. It is, therefore, still of interest to report accurately all details regarding cases of actinomycosis and thus stimulate further research in the life-history of actinomyces.

TABLE 8

ONE HUNDRED NINETEEN CASES OF ACTINOMYCOSIS COLLECTED FROM THE LIERATURE

Anatomic location

Abdomen	2
Appendix	7
Arm	1
Cecum	1
Chest wall	2
Coccyx	2
Colon	1
General	3
Gluteal region	1
Head and neck	62
Intestine and liver	1
Liver	1
Lumbar region	1
Lung	16*
Lung and abdomen	1
Lung and chest	1
Mediastinum	1
Omentum and intestine	1
Ovaries	2
Pelvis	5
Peritoneum	2
Ribs and vertebrae	1
Right iliac fossa	1
Skin	1
Thumb	1
Tonsil	1

*Many of these are probably nocardiosis rather than actinomycosis.

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DISCUSSION

DR. GORDON B. NEW, Rochester: A few words concerning clinical actinomycosis of the head and neck may be of interest. We have has sixty-five cases in the last few years, many of which had been overlooked elsewhere because a clinical diagnosis was not made. The physician who drained the phlegmon did not look for actinomycosis. Previous to a year and a half ago I was not looking for actinomycosis of the tongue but since that time we have seen three cases and that is true of actinomycosis in general. One must be looking for the sulphur body at the time the phlegmon is drained. A few pictures will show the types to be found, and I will have some thrown on the screen.

In demonstrating the sulphur body it is well to examine the new pockets. In pockets that have been drained and have a lot of secondary infection, it is difficult to demonstrate them. Many cases are taken for tubercular glands of the neck or sarcoma of the jaw. The condition spreads, usually, superficially although at times there is deep thickening of the neck. In some cases there are tumors as hard as a malignant growth. One patient case in with a three months' history of difficulty in opening the mouth, and acute pain. The physician had diagnosed a malignant growth. One patient came in with a malignant tumor, but probably was inflammatory.

Three months later the man returned and we found actinomycosis.

Another case was a bilateral actinomycosis of the neck which had been taken for Hodgkin's disease. Some cases have had bilateral glands of the neck and have been treated for tuberculous glands. One man was operated on for malignant thyroid.

One patient came with a history of six months' difficulty in opening the jaw. We gave him ether and could not demonstrate any reason for the difficulty. A few months later we found the sulphur bodies in a phlegmon in the parotid region. The man died six months after he was first seen; the condition apparently originating in the tonsils or about the teeth.

I think that the slides I have shown demonstrate that a clinical diagnosis of malignancy must be made guardedly. I believe many of the mistakes in diagnosis are due to the fact that physicians do not look for sulphur bodies when the phlegmon is drained. In most cases the correct diagnosis is overlooked, the condition being mistaken for malignant tumors such as Hodgkin's disease, sarcoma, and so forth, or simple phlegmons following tonsillectomy or removal of teeth, tuberculous glands, and so forth. I believe a guarded opinion should be given in tumors of the head and neck that are probably malignant but might be actinomycosis.

DR. N. L. LINNEMANN, Duluth: I am interested in this subject because about a year ago I had occasion to see a case of actinomycosis. There were broken down tumors and we were able to discover the fungus very readily. The man had had the infection for about two months when we saw him and claimed to have been infected by a dog that scratched his face. We had a dog team through here at about that time, known as the Klondyke dogs and some of them died. We had the patient under observation for some time and there was no doubt about the diagnosis.

DR. MOSES BARRON, Minneapolis: I wish to mention one procedure in the diagnosis of actinomycosis, which has not been touched upon in this paper. I am referring to the microscopic examination of the tissue removed from the wall of the lesion. I have seen a number of cases where this has proved of great service. In one case, at the St. Paul City & County Hospital, a clinical diagnosis of carcinoma of the base of the tongue had been made, because there was a brawny, indurated mass in the region just above the larynx. The infiltrated tumorous mass was incised, and portions of the tissue were removed for histological examination.

Microscopically, the tissue showed extensive chronic inflammation, which, on very careful study, revealed several small rosettes of the ray fungus. Without this microscopic study of the tissue, the correct diagnosis would have been overlooked, as there were, as yet, no discharging sinuses and no macroscopic pus. One should always curette out small pieces of tissue for histologic study, as this alone may reveal the fungus, in cases where the discharging pus may show none of the characteristic "sulfur" granules after the abscesses had become secondarily infected with various contaminating bacteria.

SUSPENSION AND TRACTION IN TREATMENT OF FRACTURES OF EXTREMITIES*

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History: Suspension and traction in the treatment of fractures of the extremities have been used for many years. In a review of the history of this subject we read that in 1819, Daniell of Savannah, Ga., applied the weight and pulley to obtain permanent extension. In 1855, Vaningen of Schenectady, N. Y., elevated the foot of the bed to obtain counterextension. Adhesive straps applied to the leg to obtain adequate support for extension were first used by Sargent of Philadelphia. This method was adopted and popularized by Buck, sometime before 1852. He, in 1857, also adopted the elevation of the foot of the bed to obtain counterextension.

During the Civil War the genius of John T. Hodgen produced the splint that bears his name. This splint served advantageously both for suspension and the dressings of compound fractures. Working at this period in Liverpool, was a surgeon whose work on fractures was a great advancement in medical knowledge. The Thomas leg splint was first reported by him about 1879, and it is this splint which today is the most serviceable for suspension and traction.

Some years ago, Ransohoff advocated the use of icetong callipers applied to the condyles of the femur to obtain traction. Later the Codavilla and Steinman pins were designed and used for continuous extension. The Finochietti stirrup on the other hand was designed for temporary traction only, but Chutro, as associate of Finochietti in Buenos Aries, has since utilized it for continuous traction.

*Presented before the Minnesota State Medical Association, Duluth, Minn., August 1921.

In recent years, because of surgical necessities during the war, these various methods have received greater attention and through the work and teachings of Jones, Blake, Speed, Teas, Moorhead and others, some of these methods have, in a measure, been standardized. The oration on this subject given by Doctor Joseph Blake before this body one year ago, and the remarkable results that he showed, has given us a special interest in this subject.

Adaptable by general practitioner: These methods have been used largely in centers where especially trained men are available. The question arises as to whether or not these methods may be adaptable to the use of the general practitioner and the man in remote districts. Of the many fractures occurring in all parts of the country comparatively few can be treated in special institutions. It is our belief that these methods can be used by the average man. Each village has a balcksmith and a carpenter, and these are the only crafts necessary for the making of splints, fracture frames, etc. With proper direction this work may be done very satisfactorily, quickly and at a minimum cost.

Advantages and disadvantages: Suspension and traction may be used in all cases of fractures of extremities with deformity or overlapping of fragments. It adds greatly to the comfort of the patient and to the ease of nursing. By it, we can maintain reduction for any type of fracture, easily care for the wound if compounded, and obtain earlier restoration of function. This is due to early mobility of joints, thus allowing minimum adhesions of muscles and joints to form.

The only disadvantage is, that it confines the patient to his bed. This is especially irksome to the patient in cases of fracture of arm or forearm.

Suspension apparatus: The apparatus for suspension consists of the Balkan frame, or any of its modifications, the essential parts of which, are two upright solid frames at the foot and the head of the bed connected above the bed by a longitudinal bar. Attached to this longitudinal bar are adjustable pulleys, best arranged in form of trolley to permit greater motion of the limb and more comfort to the patient. These pulleys should be smooth running, thus avoding undue friction. The longitudinal bar should be adjustable on the upright at the head and foot of the bed. This frame is very simple and takes but a short time to construct. It may be built either of wood or metal, and made adjustable to fit any kind of hospital bed. The limb is directly suspended by metal frame or canvas bands, to which is attached ropes running through the pulleys above and attached to sufficient weight to counterbalance the weight of the limb. The limb is thus suspended in the air and permits a large range of motion to the remainder of the patient's body. The Thomas splint is now universally used for suspension of the limb. It is easy to construct and can be adapted to use either on the upper or lower limbs.

Traction: According to Jones, traction of the limb must be divided into one or the other of two groups, depending upon whether the counterextension is supplied by the weight of the patient's body or by the backward extension of the splint on the tuberosity of the ischium and buttocks. Similarly in traction of the upper extremity, the counterextension is either the body of the patient or the backward extension of the splint against the shoulder and axilla. In the lower extremity the utilization of the body weight is counteracted by elevating the foot of the bed. In our experience with fractures of the femur the fragments are better immobilized where the counter-extension is supplied by the backward extension of the splint on the tuberosity of the ischium.

There are two methods of obtaining traction: either by direct application to the bone (so-called skeletal traction), or by application to the skin surface with adhesive material. Each method has its advantages and disadvantages and whichever method is used depends upon the individual case. The direct application to the bone is more efficient so far as traction is concerned, but it has the objection that it requires an open operation and exposes the patient to a certain risk of infection. It is contraindicated where there is danger of contamination from an infected wound.

Skeletal traction: This skeletal traction is obtained by anchorage to the bone by the use of the pin the ice-tong callipers, and the stirrup.

The application of these requires the same aseptic technique as any operation. A general anesthetic is usually advisable in the application of the skeletal apparatus and the manipulation of the fracture.

We believe the Steinman pin to be the most useful of these methods in treating fractures of the lower extremities. It permits a firm anchorage to bone and does not present the danger of slipping or tilting. It may be applied above the condyles of the femur, in the head of the tibia, above the ankle joint and either over or through the os calcis. Any steel pin sharpened at one end may serve the same purpose, but if it is threaded so as to unscrew in the middle both halves of the pin may be removed without danger of contaminating the wound. In its application the skin is pulled up on one side proximal to the direction of traction and a small opening made to the bone with the knife. The pin is inserted in this opening and forced through the center of the bone transversely and out against the skin on the opposite side, which is again pulled taut and an incision made in the skin to release the pin. Traction apparatus may then be attached to the pin by the ordinary calliper or any strong wires. The pin may be inserted in the head of the tibia in cases of low fracture of the femur, or over the os calcis in case of fracture of the bones of the leg.

The ice-tong callipers may be applied above the condyles of the femur to obtain traction for fractured femur. We have found them also very serviceable in fractures of the leg bones. In such cases they are applied just above the malleoli, great care being taken that they do not come too low and enter the ankle joint. In placing the tongs, the technique used is similar to that used in placing the Steinman pin.

The Finochietti stirrup is confined in its use to traction on the os calcis and as first constructed was for temporary traction to reduce fractures of the leg, but later was popularized by Chutro for permanent traction. We believe its use in this country is very limited. We have not used it, but show it as a matter of interest.

Skin traction: The surgical principle of accomplishing most in the least radical manner should apply to this method of traction treatment of fractures. Skeletal traction is a radical procedure and exposes the patient to infection; it, therefore, should be avoided when possible. The use of adhesive applied to the skin for adequate support to obtain extension has been universally used with varying results. The objection to this method being the inability to obtain a glue that would stand the stress of traction and also not cause injury to the skin.

Zinc oxide adhesive material is the least satisfactory. It is frequently used because it is usually at hand and is easily applied. In almost all cases it produces blistering of the skin. The injury to the skin is a source of undue irritation to the patient and soon this method of traction must be discontinued.

The Sinclair formula of glue or adhesive material, if properly made and applied, is very satisfactory. It can be applied without first shaving the parts and is easily removed by the use of moist heat. Experience shows, however, that it is likely to cause blistering of the skin early in the treatment.

Recently Cunningham has described a formula for glue in traction which we have found very suitable and now use entirely in our cases. As described by Cunningham, it consists of a solution of celloidin in acetone. The celloidin material may be obtained in bulk from a supply house, but we have found the celloidin in discarded x-ray films to be very satisfactory. The gelatin emulsion is dissolved and washed off with hot water leaving the clear sheet of celloidin. The required amount of celloidin and acetone is placed in a dry, clean, wide-mouthed bottle and securely stoppered. The bottle is then vigorously shaken or agitated at intervals, and the solution is ready for use in twenty-four to forty-eight hours. When properly made it should be an almost clear, homogeneous, syrupy fluid. When applied the skin should be clean and dry. The part should not be shaven for the hairs increase the efficiency of the adhesive, like hair in plaster. A layer of the solution is rapidly put on by a brush. The quantity should be sufficient to soak through the strip on which traction is to be applied. Canton flannel is the best material for strips. After sufficient time has elapsed

for evaporation of the acetone and drying, the straps are then ready for traction. We have found that this adhesive causes no blistering and stands the stress of extension a satisfactory length of time.

As accessory apparatus in this method of treatment we must mention the use of the glove and Sinclair skate. In cases of low fracture of the forearm or in fractures with open wounds of the forearm, the gloves may be used very satisfactorily to obtain extension. The hand is first painted with glue and then the glove put on. After drying, traction is made on the fingers of the glove. If the extension is not slackened each day to allow motion of the joints, there is a great danger of developing stiffness of the fingers. We have not had satfactory results in the use of permanent extension in cases of fractures of the forearm. The amount of traction in the fracture was small and the apparatus was never comfortable to the patient.

The Sinclair skate is an ingenious device which may be used very satisfactorily in lower fractures of the leg, or those involving the ankle joint. It consists of a board somewhat longer and wider than the foot. In its center is a longitudinal slot so that a transverse bar is attached by a bolt and adjusted to any position. The edges of the board contain several notches. Straps are glued to the sole and sides of the foot and curtain rings so attached to these, that there is a row on each side of the foot. The board is fastened by passing tapes through the rings and over the board. The position of the foot may then be regulated by changing the transverse bar in the longitudinal slot of the board.

Care and after treatment: This treatment is a great source of comfort to the patient and allows early mobility of the joints. To maintain this and to obtain proper results requires untiring personal care of the patient on the part of the physician. This should consist of careful observation of the case once or twice daily. All complaints of the patient should be given immediate attention, and it may be necessary to adjust the apparatus at frequent intervals, if the comfort of the patient is to be insured; more padding may be required over tender areas to prevent injury to the skin, and if any deformity or undue abduction or adduction exists, this should be corrected. In case of fracture of the middle third of the femur one is very likely to get a sag of bone at the site of fracture unless careful observations are made and gravity considered. There are many ingenious and useful devices for preventing foot drop. These consist in strapping the foot to an upright support attached to the Thomas splint or by the use of adhesive strap attached to the Thomas splint or by the use of an adhesive strap attached to the sole of the foot and suspended by a rope to the weight and pulley.

The position of the fragments and the amount of extension are best accurately observed by roentgenographs and this by the use of the portable x-ray machine There are few portable x-ray units used by physicians, but a dental x-ray apparatus may serve the same purpose.

When treating fractures it should be remembered that the part consists of other structures besides bone. The patient may have good position of fragments and a firm bony union, but still have poor function because of stiffness of joints and atrophy of muscles. Suspension of the extremity aids circulation and relieves swelling. Massage should be started in all cases within the first few days after injury unless contraindicated by infection. Mobilization of joints should also be started at the earliest possible time, but only after one is sure that the fracture is immobilized. Often with correct apparatus and proper instructions, the patient may be able to do his own mobilizing. In this connection the Pearson modification of the Thomas splint is very useful. This device is attached to the Thomas splint at the level of the knee joint and the leg rests in it. It is so constructed that when the patient, by use of a rope and pulley elevates or lowers the device, the leg is extended or flexed at the knee, thus preventing stiffness of the knee joint. In fractures of upper extremities similar apparatus is used allowing mobility of the joints. In fractures of the humerus the suspended forearm permits of a small degree of flexion and extension at the elbow. The hand is free, allowing motion of wrist and fingers.

This mobilization and massage should be used early, not to restore mobility, but as a preventive measure to insure that joints which have not received injury maintain their mo-

bility and that the muscles are kept in as good condition as circumstances will permit. Once stiffness has occurred in a joint, the work of restoring the mobility becomes tedious and disappointing.

The last step in the treatment of fractures of the lower extremities is to get the patient to walking as early as possible. To do this requires some form of splint that will permit weight bearing before bony union is firm. The Thomas walking calliper or its modifications serve this purpose. It is so constructed that the weight of the body is carried directly from the tuberosity of the ischium to the socket in the heel of the shoe with no weight on the leg. These splints are rigid at the knee but the heel socket permits ankle motion. The side rods may be solid and of correct length, but by inserting a turnbuckle the rod may be lengthened or shortened to fit any case. This splint may be used in all fractures of femur and fractures of leg bones.

SUMMARY

1. Although suspension and traction treatment has been used for several decades, it is only during and after the recent war that there has been some standardization of the method.

2. It is a source of comfort to the patient; reduction can easily be maintained and earlier restoration of function is obtained.

3. The method is adaptable to the use of the general practitioner. The apparatus may be constructed quickly and at a minimum cost.

4. Extension may be obtained by either skeletal or skin traction.

5. This method requires the untiring personal care of the patient by the physician.

6. Massage and passive motion should be started as early as is consistent with immobility of the fracture

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DISCUSSION

DR. A. J. BRADEN, Duluth: I think it is a discredit to American surgery that the idea of suspension-traction that was so perfectly worked out by Hodgen should have been allowed to fall into disuse to be revived by foreigners in the Balkan war, and later during the great war.

We now learn from these foreigners the great advantages of this treatment, and we see it accepted by the highest authorities in the treatment of shaft fracture, and it seems to me it would be well for our American writers to take cognizance of the work that has been done in this country and give the credit where it belongs.

During the past two or three years there has been an enormous amount of literature on the subject of fractures and the suspension-traction treatment of them. Almost every form of fracture has been subjected to this treatment and sometimes perhaps without very much judgment as to whether it was the proper method or not. Of course, that is something that occurs a great many times when some new method of treatment comes to the attention of the profession. Any method for the treatment of fractures should be so simple and practical that anyone at all skilled can carry it out. Many of the methods suggested for the suspension-traction treatment of fractures are complicated and difficult to carry out and only suitable for use in an institution where the closest attention can be given. In this the value of Dr. Ide's paper can be seen. He has worked the matter out very conservatively and practically and in a way that almost anyone can understand.

One use of this method—I do not know that Dr. Ide mentioned it—is in displacing of operative treatment of fractures of the upper and lower extremities. Fractures that resisted all ordinary methods of reduction three or four or five years ago,, would have been considered proper cases for operative treatment, but can now be subjected to the suspension-traction treatment, and operative procedures avoided.

Furthermore, I did not notice he mentioned the use of suspension-traction method of treatment in cases of vicious union where there is considerable overlapping of the fragments. In these cases the fractures can be thoroughly mobilized by open method, and instead of applying other methods of fixation, suspension-traction can be applied and the wound in these cases can be closed at once, and thus you do not have to subject the patient to further operative procedures. Through the traction the contracted muscles are overcome, and by arranging the line of traction, the parts fall into natural position. I think when this can be done there is a great deal saved for the patient and also for the surgeon.

I think the doctor has mentioned most of the advantages that come from this method of treatment. I wish to say that I think traction with tongs and pins is no more painful and brutal than the external application of traction, which is applied more to the muscles and skin and tendons. There is really less pain with tongs and pins when properly applied than other methods of extension. One thing should be remembered, in applying tongs the skin should be drawn upwards and then applied in position so there is no tension on the soft tissues. This method of treatment is only suitable in a very limited number of cases of fractures of the arm.

In the majority of cases other methods are less

complicated, more comfortable for the patient and secure as good or better results.

DR. L. DAUGHERTY, St. Paul: I think Dr. Ide is to be congratulated on his paper. It is timely and interesting. There is no question but what the suspension-traction treatment of fractures is the treatment par excellence in many of these cases. Although it was used many years before, it came into popularity during the war. I was taught its use some fifteen years ago by Dr. More. Many of these appliances and splints shown by Dr. Ide are not as complicated as they look. Our hospitals are not properly equipped to treat fractures. That is not the fault of the hospital, but it is the fault of the attending staff. Personally, I derive a great deal of pleasure and satisfaction in making my own splints and my own traction apparatus, and it is not difficult to do. I do not agree with Dr. Braden, as I think this apparatus can be used in the home and in the country as well as in the hospital.

In a recent attempt at self-criticism, in reviewing some 500 fracture cases, I tried to find where my mistakes had been and why some of my results were not satisfactory and I reached the conclusion that the fault was not due to the method but due to my own personal negligence. I did not inspect these fractures often enough. I do not know of any branch in surgery where, it seems to me, that success lies more in frequent inspection than it does in the treatment of fractures.

Just one word more. In fractures of the forearms, and in fractures of the upper arm, I wish to recommend the local anesthetic method, the injection of the brachial plexus as worked out by Kulenkamp. It is a simple procedure. When you inject the brachial plexus you have complete anesthesia of the arm and you are able to reduce these fractures without any pain whatever to the patient.

DR. M. S. HENDERSON, Rochester: We are indebted to Dr. Ide for bringing this phase of the subject of fractures before our notice, and I wish to congratulate him on the manner in which he has done so. I also agree with Dr. Daugherty that from a theoretical viewpoint at least it is a treatment par excellence. From a practical view point, however, I wish to say that I agree with much that Dr. Braden has said. That is, that all of us cannot carry out this treatment. The chief difficulty is that constant attention is necessary. I feel that Dr. Daugherty is unnecessarily taking the blame for some poor results that he says has followed the use of this method. It is not possible for anybody to be in constant attendance to see that the proper traction and alignment are held. In large institutions, with fracture wards and trained attendants, the treatment can be carried out probably very efficiently. I think that many of these fractures should be operated upon. I do not by any means think that all should be operated upon. I find that in my own service I am using the open operation more and more and have found that beef bone screws and plates have been of great aid. They are less irritating to the tissues than metal and if you obtain anatomical alignment, apply the plate with the screws, and then put on a suitable plaster of Paris cast, you are sure of a perfect result. If you get a perfect anatomical result, you can practically be sure of a good functional result. My part in this discussion is not to advocate the open treatment for all fractures, as stated before, but I do think that we are leaning now a little too much to the conservative treatment, and under the proper surroundings and with the necessary equipment in recent fractures good results can be obtained by the open operation that might have given bad results by conservative measures.

DR. EMIL S. GEIST, Mnneapolis: I wish to thank Dr. Ide for his excellent paper. I want to speak briefly of two points. I see quite a number of cases of old fractures. I have been called in a number of times to defend doctors in malpractice suits in cases of fracture. Fractures are a fertile field for malpractice suits, and as a result of my experience in this field of work I should like to make the suggestion that fractures are as a rule, serious conditions. It would be well for any one who has a fracture to deal with to call in a consultant. No matter who the consultant is, a consultation may stop a lot of malpractice suits in fracture cases.

The other point I wish to speak of is one of an historical nature. While the doctor was reading his paper I was wondering just where this suspension-traction plan of treatment of fractures really originated. A Frenchman by the name of Lucas Champonniere years ago wrote a large book on this subject. A German by the name of Bardenhauer also wrote a large book on this subject.

A Scandinavian in the nineties of the last century wrote on this subject very completely and thoroughly and, of course, in the Balkan war, from which we get the name Balkan frame, this method of treatmen was frequently used. It is an excellent method. However, it requires considerable ingenuity on the part of the man who is handling it. He must have great anatomical skill and must know what he is doing to apply it successfully.

The open method is a splendid one in obtaining anatomical and as a rule good functional results. It is a two-edged sort of knife and unless we are absolutely sure of our asepsis, it is better to get some shortening than to get an infected fracture.

DR. C. W. MORE, Eveleth: For the past thirty years, we have used the Hodgen extension-suspension method, more or less, in the treatment of fractures of the leg. The first few years we had no hospital facilities and used it at the patients' homes, ordinary boarding houses and shacks, or wherever they might be. Good alignment and functional results were obtained in the majority of cases, but the anatomical position of the bones, as shown by the x-ray

years later, in some of the cases was not so satisfactory.

Dr. Daugherty has emphasized the point that the closed treatment of fractures requires constant care. Where the conditions are such that open treatment cannot be carried out, the method that has been outlined by the essayist is to be recommended. It can be used by anyone with a little ingenuity and some mechanical knowledge.

DR. A. W. IDE, Brainerd, (closing): A decided effort should be made to standardize the treatment of fractures. A few years ago we could get out our old Scudder and put up our fractures according to the methods described. Now these descriptions are to be found only in the literature. It is not as easy to follow these newer methods. Moreover the average man must follow the method that is generally considered good practice. The courts may review his work.

Can the patient be treated in large fracture wards? There are no large fracture wards. Cook county, Massachusettes General, Bellevue, and Montreal General have large fracture services, but in most of the large institutions there is no fracture service. This work is divided up among different men. In the more isolated communities the general practitioner must treat these people. There is no one else to do it. Is there any reason why a patient in the country with a fractured femur should not be brought to town in a Thomas splint, placed in a boarding house and treated there successfully?

There were many interesting points brought up in the discsssion. I want to thank the members for discussing our paper so freely.

THE PRIMARY LESION IN CANCER*

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We, as a profession, especially during the past decade, have more and more learned to develop a bird's eye view of disease. We are diagnosing and treating disease now not so much from the standpoint of symptoms as from its etiology. In a case of arthritis, we think not only of the swollen, painful joints, but we examine tonsils, teeth, sinuses, urethra, etc., for the primary focus. In tuberculosis of bones, tendons and lymphatics, we are not now satisfied until we have carefully examined the lung for evidence of a primary lesion. In fact, almost any lesion which we can attribute directly to some type of infection, should be looked upon as a secondary metastatic process and the original focus determined and eradicated if it still exists.

Malignant disease, at least clinically, in many respects resembles infections. One of its constant features is that it always has a primary focus, an initial lesion, from which it spreads into regional and distant parts of the body. This lesion consists of cell proliferation in a lawless manner. Its growth does not conform to any of the laws of tissue development, but penetrates in an inorderly manner into the surrounding structures and, if left alone, eventually destroys life. What produces the growth we do not know. We do know, however, that in order to produce a cure, it must be removed while it is still a local or at least a regional disease.

If such a lesion is located on or near the body surface, it should not often be overlooked. It is surprising, however, how often a metastatic lesion in the deeper parts may be treated as primary when a relatively superficial primary lesion is self-evident. It not infrequently happens that tumors, especially of the bones and lung, engage the attention of the clinician to the extent that he entirely overlooks primary lesion, which at that time may be very obvious in the thyroid, prostate, kidney or breast. While associated in one of the large Chicago Clinics, I can recall having on my service at one time three cases of metastatic carcinoma of the neck of the femur, with pathologic fracture in which the primary tumor a carcinoma in the breast, had been entirely overlooked. This, of course, can be attributed only to lack of a thorough examination or unfamiliarity with the pathologic process.

Of recent years, we have developed to a high degree of efficiency endoscopic examinations. This has enabled us to recognize lesions in the lower bowel, bladder, vagina, throat, nose and accessory sinuses at a date early enough to be of some definite service to the patient. I believe, however, that these examinations too often are neglected. Every year the writer still has several cases come to the hospital and dispensary service sent in for hemorrhoids when a low proctoscopic or even a digital ex-

*Read before the Clinical Club of Minneapolis, May 19th, 1921.

amination at once reveals an advanced carcinoma. Too often suppositories, douches, nasal sprays and urinary sedatives are prescribed without a preliminary examination. It therefore occurs that the early primary lesion in these relatively hidden away places is not discovered in time to produce a cure and treatment henceforth becomes symptomatic.

There is a class of malignancies, however, hidden away in the deeper structures which may for a long time give neither local nor general evidence of their presence. It is this class that I particularly refer to as hidden cancer. They are found almost entirely in the gastro-intestinal tract and its communicating ducts. Statistics tell us that approximately fifty per cent of all cancers occur in this hidden area. Most of these are recognized too late to reach the primary lesion before it has metastasized into distant parts. Many of these cases during their incipiency, complain only of vague symptoms. Some consult their physician for a metastatic growth without having had at any time symptoms from the hidden primary tumor. In the majority, however, there are symptoms, though vague they may be, which demand a thorough investigation.

With careful x-ray, chemical and physical examinations and even in some instances, on suspicion, exploratory operations, we will be able to recognize a greater proportion of cancers at a time early enough to operate on the initial lesion. Many of these cases, however, are operated when a physical examination would reveal superficial metastases in the glands which at once renders such a major procedure entirely unnecessary except for symptomatic relief. Extensive operations on the stomach and bowels are not infrequently performed when a small metastatic supraclavicular gland is present. On the other hand, many superficial metastases are operated thinking they are primary when they are only a superficial evidence of a deep-seated, perhaps unrecognizable, primary lesion.

Since it is a definitely established fact that in order to cure cancer we must eradicate the primary lesion, we should always keep this in mind and determine, if possible, whether we are dealing with primary or secondary foci.

There are numerous cases in which the primary lesion is entirely overlooked, some of which are never discovered without a careful post-mortem examination. During the past few months, several of these have come under my observation and will serve as illustrations:

Case No. 19449. Male, age 54. Admitted to the University Hospital July 21, 1920. He gave a history of always having been well up to the present trouble. During the last part of April 1920, his daughter noticed a nodule the size of a hazelnut just above the clavicle on the left side. This grew rapidly and in about two weeks, reached the size of a baseball. When it was first noticed, he consulted a physician, who gave him some ointment to apply, without result. Two weeks later, he consulted another physician who gave him electric treatment—probably x-ray. Under this the growth became smaller. He had no pain, but occasionally noticed a little difficulty in swallowing. During the next two weeks, his voice became husky.

Physical examination was negative, except for a large mass about the size of a fist in the left side of the neck, just above the clavicle. This mass was smooth, freely movable and not adherent to the skin. The urine was negative, hemoglobin 75 per cent; W. B. C. 7,500; differential W. B. C. normal; blood pressure 105/60; Wassermann negative.

Laryngoscopic examination revealed extensive edema of the glottis on the left side, with a slightly hemorrhagic appearance of the mucous membrane.

July 26, 1920, he was operated and an attempt made to remove the mass which was found to be very extensive and adherent to all the vessels and nerve trunks in that region. During the operation, the patient had great difficulty in breathing and at one time, stopped altogether and was carried under artificial respiration for twenty minutes. After the operation, he still had difficulty in breathing. On the following day his temperature rose to 105 and he died during the night.

Microscopic examination of the tumor mass proved it to be squamous cell carcinoma. July 28th a complete post mortem was performed, which revealed the following positive findings:

Pleural cavity right lower lung obliterated by adhesions.

Early diffuse bronchial pneumonia in left lung.

Lymph nodes in upper part of abdomen markedly enlarged. A few enlarged nodes at bifurcation of trachea.

The larynx had marked edema of the entire left side. This terminated very abruptly at the mid-line and the right side appeared normal.

In the deep folds of the pharynx on the left side, was a large ulcer, measuring about two cm. in diameter. This showed ulcerated edges and marked induration of the tissues around the ulceration. Microscopic examination proved this to be a squamous cell carcinoma—the primary lesion from which metastases had taken place into the left supraclavicular glands.

Case No. 15450. Male, age 50.(Laborer. Personal, past and venereal history negative. Came to Surgical Department of the University Dispensary on November 5, 1920, complaining of enlarged glands at both sides of neck and slight difficulty in breathing.

He gave the following history: March 1920, first noticed an enlargement in the right cervical region. This gradually enlarged. In June 1920 he noticed a little difficulty in breathing through his nose. In July 1920, slight enlargement of glands in left cervical region. In August 1920, consulted a physician, who incised and drained the enlarged glands on right side of neck. No pus was found; but after a week, began to discharge a little pus. He was given a nose spray to relieve his breathing.

Physical examination revealed enlarged glands in both sides of neck, more marked on right than left. Aside from this, his physical examination was negative.

Blood: hemoglobin 80; R. B. C. 4,500,000; W. B. C. 11,800; differential W. B. C. normal; Wassermann negative; urine negative.

November 11th, x-ray of chest was negative for tuberculosis and Hodgkins disease. X-ray of sinuses revealed a haziness of both maxillary region—no evidence of involvement of bone structure.

November 13th, gland removed from neck for diagnosis. Microscopic examination revealed squamous cell carcinoma.

November 22nd, nose and throat consultation revealed ulcerating carcinoma below the right middle turbinate in the posterior nasal region, close to the fossa of Rosenmuller. This was evidently the primary focus from which he had cervical metastasis.

Case No. 20216. Male, age 53. Farmer. Admitted to the University Hospital November 16, 1920, with a mass in his left abdomen and a hydrocele on the left side. His family, past and venereal histories were negative. His present illness dated from February 1920, when he had influenza with pneumonia and was confined to bed for several weeks. At this time he began, upon several occasions, to notice sharp pains in his left upper abdomen.

Juy 1920, while lifting a heavy sack of corn, he felt a sudden severe pain in his left groin. Two days later he noticed a swelling in left scrotum. In October 1920, he first noticed a mass in his left abdomen. He then consulted his family physician who advised an x-ray examination.

Physical examination revealed the following positive findings: Loss of weight twenty pounds; large mass over descending colon, extending from anterior, superior spine to costal margin—hard, nodular, not movable, did not move with respiration. Liver palpable, felt nodular. Hydrocele in left scrotum size of orange—transmitted light. One single gland size of acorn in left supraclavicular region—felt hard, not adherent or painful. He said this had been present since July 1920. Some dullness over base of right lung.

Blood: hemoglobin 75 per cent; W. B. C. 7,900; differential W. B. C. normal; blood pressure 140/80; blood and spinal fluid, Wassermann negative. Blood sugar, urea and creatinin normal.

Ureteral catheterization revealed extra-ureteral obstruction on left side—hydro-ureter above obstruction. Clear urine obtained from kidney. Functional test practically normal. X-ray of chest revealed evidence of old pleurisy base of right lung. X-ray of bowel revealed partial obstruction with filling defect at juncture of descending colon and sigmoid.

December 7, 1920, left supraclavicular gland was removed for microscopic examination. This proved to be a squamous cell carcinoma, evidently metastatic from the primary lesion in the colon. An abdominal operation was therefore ruled out. The result was obvious and the patient was sent home. His primary tumor and metastases continued to grow and he died March 28, 1921.

Case No. 19851. Male, age 63. Admitted to University Hospital September 21, 1920, with the following history:

Personal, past and venereal histories negative. He was well until the winter of 1919, at which time he began to notice some pain in his left arm and shoulder. This gave him trouble occasionally and gradually increased in severity. November 1919 noticed a small gland the size of a pea in the left supraclavicular space; by February 15, 1920, it has reached the size of an egg and his left arm had become swollen and stiff.

He consulted a physician who removed the mass. Following this, he had some improvement of the pain in the arm, but soon noticed a mass appearing just to the right of the old incision, which continued to grow. He had gradually lost weight and suffered intense pain in his left arm and shoulder.

Physical examination revealed a large mass in the left supraclavicular fossa. Mass was hard, nodular and not movable. Left axillary glands palpable and hard. In the abdomen there was a palpable mass six cm. below the costal margin to the right of the mid-line—tender and painful. Hemoglobin 70 per cent; W. B. C. 7,200; Wassermann negative. Urine negative. Case was obviously an inoperable malignancy. He grew gradually worse and November 21, 1920 died.

A complete postmorten was done, which revealed the following positive findings: The pancreas showed replacement of the head portion by a very firm tumor mass about six cm. in diameter which irregularly invaded the surrounding tissues and faded off imperceptibly into the mid-portion of the pancreas which was firm and somewhat atrophied. The tumor was firmly attached to the inferior vena cava, at one point having grown through the wall. There were numerous very hard lymph nodes along the aorta and along the pancreas. There were large, metastatic, cancer nodules throughout the liver, kidneys and adrenal glands. There was a large metastic tumor at the root of the left side of the neck involving the first rib and clavicle. Microscopic ex-

amination of these revealed carcinoma. The primary lesion was in the pancreas and the deep metastasis in the liver and kidney had occurred later. The superficial evidence was the enlarged left supraclavicular gland.

Case No. 20217. Female, age 32. Admitted to the University Hospital November 16, 1920 with the following history: About September 11, 1920, felt occasionally a few sharp pains in the left lower abdomen. The abdomen had gradually become larger and since she had not menstruated since September 15th, it was thought that she was probably pregnant.

November 6th, while lifting a pail of water, she had sudden severe pains in the left lower quadrant. This was followed by diffuse tenderness and marked enlargement of the abdomen. A physician was called, who made a tentative diagnosis of ruptured ectopic pregnancy.

Examination revealed the following. The abdomen was very much distended, apparently filled with fluid. There were some hard nodules in the left upper quadrant. Vaginal examination revealed some small, hard masses in the cul-de-sac. Hemoglobin 77 per cent; R. B. C. 4,500,000; W. B. C. 13,700; differential W. B. C. normal; blood pressure 120/70; Wassermann negative. Urine negative.

She gradually became worse and an exploratory laparotomy was performed November 18th. A lower abdominal median incision was made. The abdomen was filled with a sero-sanguinous fluid. The parietal and visceral peritoneum was covered with miliary tubercles. The uterus was soft and about two months pregnant. There were massive adhesions in the upper abdomen and the omentum was adherent to the anterior abdominal wall.

Diagnosis of miliary tuberculosis was made and the abdomen closed.

After the operation, she continued to fail and on November 26th died.

A complete post-mortem was performed with the following positive findings: Upon opening the peritoneal cavity, there was marked thickening of the peritoneal coat. Both visceral and parietal layers were covered with numerous miliary nodules. The loops of the intestines were bound together and could be separated with difficulty. The upper abdomen was one mass of adhesions. The surfaces of the spleen and liver were covered with miliary nodules. A diagnosis of miliary tuberculosis was made. Upon more careful examination of the organs, a primary tumor was discovered in the stomach. There was a depressed area, measuring 2 by 4 cm. evidently the site of an old ulcer. This was very hard and upon microscopic examination, proved to be carcinoma. Upon further investigation, the nodules in the omentum and throughout the peritoneum, proved microscopically to be carcinoma.

Without a thorough investigation, this case would have passed as abdominal miliary tuberculosis.

Case No. 19631. Female, age 61. Admitted to the University Hospital with the following history. October 1919, she had a sudden severe pain in her left eye, lasting only for a short time. That evening, when she attempted to read, the pain returned and she discovered she was entirely blind in the left eye. Following this, she was better until April, when the pain returned, accompanied by severe attacks of nausea and vomiting.

August 18, 1920, she was admitted to the University Hospital for glaucoma. August 20th, left eye was enucleated and for some time, the right eye was treated for glaucoma and iritis.

October 15,1920, she began to have severe attacks of pain in the region of the gall-bladder and examination revealed a soft mass extending down from the costal margin. This seemed tender and there was marked muscle spasm over it.

Hemoglobin was 70 per cent; W. B. C. 7,500; differential W. B. C. normal; Wassermann negative; blood pressure 116/68. Urine showed a few hyaline casts. X-ray of stomach normal.

October 25, 1920, an exploratory operation was done. Free bloody fluid was present in the abdomen and the liver was studded with metastatic tumor nodules. The gall-bladder was contracted and hard. A diagnosis of primary carcinoma of the gall-bladder was made and the case considered inoperable.

Patient grew gradually worse and died November 9, 1920.

A complete post mortem was done, which revealed the following findings: Hemorrhagic bronchial pneumonia—both lungs. Old tuberculous cavities in right apex. Liver was filled with tumor nodules throughout. Many of nodules black in color—others grayish, with black mottling. Gall-bladder filled with stones. No evidence of tumor in gall-bladder or stomach. The primary lesion could not be found and upon microscopic examination, it was found that nodules in the liver were melanotic sarcoma. When this was revealed, the eye, which had previously been removed in August, but not sectioned, was now opened. A tumor mass was found in the region of the attachment of the optic nerve. This was dark, almost black in color and grew forward into the cavity of eyeball and almost filled the posterior chamber. Microscopic examination revealed it to be a melanoma of the eye, the primary focus from which distant metastases had occurred.

From available world-wide statistics, it would seem that cancer is definitely on the increase. We are in a cancer age. Extensive experimental data have been accumulated, but so far have done very little to lower the mortality. I am impressed with the necessity of thorough clinical investigations, of careful records made of histories, examinations and operations and, above all, more thorough, complete post mortems, with evidence carefully compiled by competent pathologists.

RESULTS IN THE TREATMENT OF INFLAMMATORY DISEASES OF THE GALLBLADDER AND ITS DUCTS*

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The following paper is an inquiry into the causes of failure in the treatment of certain types of gallbladder conditions. It is based upon a review of hospital records and an attempt has been made to determine what the logical treatment should be in those cases where failure has taken place. In arriving at definite conclusions as to the results obtained in the treatment of inflammatory diseases of the gallbladder and its ducts, it is essential to recognize that we are oftentimes dealing with a different symptomatology in different patients. Jacobson[1], in his report of 397 cases observed at the Peter Bent Brigham Hospital, finds that gallbladder disease is associated with four groups of symptoms and he has divided them into the following:

(1) Cases with typical biliary colic, as described in the text books.

(2) Cases with atypical biliary symptoms where there is a dull aching pain in the upper right quadrant, accompanied by fever, nausea, vomiting and sometimes jaundice.

(3) Cases with gastric symptoms. Here there is an epigastric distress or sense of fullness after meals, which is relieved by belching of gas or by vomiting, and associated with quality food dyspepsia.

(4) Cases where there is a combination of typical biliary colic and gastric symptoms.

In giving his results as to operative treatment, where he discusses the relative merits of the various surgical procedures, he fails to give any idea as to the group which shows the least improvement, except to mention that in sixteen cases, a cholecystectomy was done on a gallbladder which proved to be normal on microscopic examination. They were cases with vague gastric symptoms and of these, six considered themselves worse than before operation.

*Presented before the Minnesota State Medical Association, Duluth, Minn., August 1921.

Inasmuch as cholecystitis is now considered as being due to an infection which is elective in nature, the trend of treatment is surgical. However, the earlier types of cases should be treated medically over a fairly long period—according to Oschner[2] and Mayo[3]. This consists of a careful dietetic regime and the selection of foods which are not apt to produce distressing symptoms. Included in this is the searching out and eradicating of all foci of infection, whether in the tonsils, teeth or sinuses. In the advanced cases and in those failing to respond to medical supervision, surgery is indicated. The published statistics all point with overwhelming evidence to the fact that cholecystectomy is the treatment of choice. This is amply illustrated by the experiences of Jacobson[1], Judd[4], Deaver[5], Mayo[3] and Adams[6]. These writers also point out that failure to obtain good results after operation are due to recurrent, persistent infection, either in the gallbladder that has previously been drained, or in the common duct. Judd[4] says that recurring symptoms are due to infection in the liver as well as in the gallbladder or ducts, for he states—"Infection in the liver, gallbladder or ducts is the most frequent cause of secondary trouble and may occur many years after the primary operation."

In looking over the records of the Warren Hospital for the past three years and reviewing the cases of gallbladder disease which came to operation, the writer has attempted to determine which group of patients is apt to give the poorest response to surgical treatment and to note the degree of pathology present; also, the length of time it takes to recover sufficiently to do ordinary work.

In all cases coming to operation, a thorough abdominal exploration was done and in addition, the appendix was removed if the patient's condition permitted. Ninety-two patients were operated upon and of these, two died as a result of the operation; one who had a gangrenous appendix at the time of operation died from a broncho-pneumonia on the fifth day and the other from a pulmonary embolus on the tenth day.

Sixty-six patients have responded to our inquiries as to their present condition and of

these, fifty-five had cholecystectomies and eleven had cholecystotomies. Of the fifty-five who had their gallbladder removed, thirty-six considered themselves cured, twelve improved and seven unimproved. Of the eleven who had simple drainage of the gallbladder, four were cured, five were improved and two were unimproved. In going over the histories of the forty cases that were well and had no complaints, thirty-three gave histories of acute attacks of abdominal pain and had considerable pathology present; one had a dull aching pain under the ribs and six had reflex symptoms. Of the seventeen that were improved, four gave histories of acute attacks of pain, three had a dull aching pain and ten had reflex symptoms. Of the unimproved cases of which there were nine, one was misdiagnosed and turned out to be a cord tumor with radiation of pain under the right costal border, the remaining eight complained of reflex gastric symptoms.

The length of time it took until the cured or improved cases felt that they were as strong as before operation varied from three to eighteen months. A few of the improved patients felt real well but stated that they could not digest certain foods as they caused bloating, heartburn and belching of gas. These symptoms, they considered of such great import that they could not class themselves as cured. This reveals that the reflex gastric symptoms are the persistent symptoms, but the patients who have had other symptoms such as severe attacks of colicy pain oftentimes forget the slight inconvenience of gastric disorders after being relieved of the major complaint. The patient, on the other hand, who comes in complaining of gastric symptoms entirely, and in whom the abdominal exploration is negative excepting for a kinked appendix, a thin walled gallbladder covered with filmy adhesions, larger than usual, and with an occasional enlarged gland near the cystic duct, is very apt to return with the original symptoms.

Of the twenty-four patients whose major complaint was the stomach, only six were cured, ten improved and the remaining eight were unimproved. In the eight unimproved cases, there was gross evidence of pathology. Some of the gallbladders were rather thick and were of the strawberry type with enlarged lymph nodes along the cystic duct, while a few were of the large thin walled kind with an enlarged gland or two along the duct. In those of thin walls, the fundus showed little evidence of infection, but along the cystic duct, there was infiltration of lymphocytes and eosinophiles.

What were the causes of failure in the eight?

(1) They may have been incorrectly diagnosed, and what was taken to be a pathological gallbladder may have been apparently normal on microscopic examination. Two of the gallbladders were probably of this type. This occurred in sixteen of Jacobson's series and six of his patients considered themselves worse than before the operation.

(2) Other abdominal pathology may have been overlooked during the exploration.

(3) The inflammatory process in the biliary tract which was treated may have been only a portion of the disease present.

Graham[7], while working at Rush Medical College, brought out the constant relation between hepatitis and cholecystitis. He observed that there is usually a certain amount of hepatic enlargement in the cases of gallbladder

TABLE I.

CURED

Cholecystectomy

Cases	Major Symptoms	Associated Symptoms and Findings
30	Acute attacks of pain	19 no stone 11 had stone 6 had reflex symptoms
1	Had dull aching pain	had reflex symptoms
5	Gastric reflex symptoms	no history of attacks of pain 4 no stone 1 had stone

Cholecystotomy

3	Acute attacks of pain	3 had stone 1 had reflex symptoms
1	Reflex symptoms	1 had stone

disease and that it is due to two factors: (1) edema of the liver and (2) infiltration of the periportal spaces with lymphocytes. In the series he worked with, he did both a cholecystectomy and cholecystotomy with relief to the patient and, as clinical improvement took place, the liver diminished in size. Last year, he did some experimental work along the same lines and he found that cholecystitis and hepatitis are invariably associated with one another and that infection in one part is kept up in the other through the lymphatics. He concludes by saying that removal of the infection in the gallbladder, preferably by excision, caused the hepatic inflammatory process to clear up.

If these conclusions are correct, we may possibly have an answer as to why certain patients do not improve in their gastric symptoms; there may be a chronic hepatitis resembling an early cirrhosis which, as Osler[8] says, may present vague gastric symptoms. Even though you did remove the gall bladder in these cases, the infective fire would continue to smoulder and produce the disorders complained of. There would then be a disturbance in the secretion of bile and its constituents and a derangement of fat digestion resulting in intestinal stasis with imperfect digestion of fats, which is commonly looked upon as the cause of the gastric symptoms. This is merely a supposition and could only be checked up by a thorough investigation of the physiology of pathological livers.

TABLE II.
IMPROVED

Cases	Major Symptoms	Associated Symptoms and Findings
	Cholecystectomy	
2	Had acute attacks of pain	no stone no reflex symptoms
2	Dull pain under ribs	reflex symptoms no stone
8	Reflex symptoms only	no stone
	Cholecystotomy	
2	Acute attacks of pain	no stone 2 reflex symptoms
1	Dull pain	no stone 1 reflex symptoms
2	Had reflex symptoms	1 had stones (recurcurence now) 2 no stone
17		

TABLE III.
UNIMPROVED

Cases	Major Symptoms	Associated Symptoms and Findings
	Cholecystectomy	
1	Acute attacks of pain	cord tumor
6	Reflex symptoms	no stone
	Cholecystotomy	
2	Reflex symptoms	no stone
9		

In order to reduce the continued morbidity after operation in this group of cases where surgery is apt to fail, we have resorted to the method of Lyon, namely: duodenal biliary lavage. This same method has been tried out as a post-operative procedure in patients who continue to complain after a sufficient length of time has been allowed to pass in order to show that operation has not relieved them. Although the series is as yet too small to be of any great significance, many of them are greatly relieved of the pain and fullness under the right costal border and a few say that they belch less gas than formerly.

In conclusion, I wish to say that the prognosis of cases following operative interference on the gallbladder and biliary tract is dependent upon the group in which the patient falls. Those patients complaining of acute attacks of pain or a dull aching pain under the right costal border are practically always cured or benefitted and in case of recurrence of symptoms, they can be re-operated on with a good reassurance of recovery. However, the patients in whom symptoms are mainly gastric, one-third or more may return with the identical symptoms and in these patients who come back and tell us how bad they feel after opera-

tion, we cannot recommend any further surgical interference with any degree of success.

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DISCUSSION

DR. H. L. ULRICH, Minneapolis: I think we should all thank Dr. Meland for bringing this paper before us. It is not often a medical section is favored by a discussion which has such a decided surgical trend. The surgeon for some years has been teaching us new facts in pathology. Just as they have done it in diseases of the thyroid, they are doing it for us in the abdominal cavity. Dr. Meland's analysis touches on some interesting points in connection with gallbladder disease. The physiology of this area is so interlaced and related to the various contiguous organs, that it is astounishing that surgical interference can bring about as many excellent results as it does. The fact that a hepatitis or a pancreatitis or both is associated with cholecystitis is only one of the recent contribution of the surgeons. That a hepatitis or pancreatitis recedes after the removal of an infected gallbladder is a still more recent assumption. Dr. Meland has rightfully questioned the recession of some of these as brought out by his statistical study of end results.

From a broader point of view of gallbladder disease I asked Dr. Cook of the Northwestern Life Insurance Company about the longevity of these people who are operated for gall bladder disease. He says it is reduced about six years. What does this mean? It means that gall bladder infection is but a part of the larger problem of focal infection and that people having focal infection are less viable than persons free from such infections. Reduction of the gall bladder is in accord with reduction of foci in other parts of the body.

Another point brought out by Dr. Meland was the use of duodenal lavage in his post-operative unsuccessful cases. Just what that can do I do not know. Lyon's diagnositic and therapeutic measure is still a questionable procedure. This is particularly true when we now know that the walls of the gallbladder are hardly developed enough to contract with enough force to expel the contents. It takes a strong intra abdominal pressure to push bile out of the gall bladder. Biliary flow is stimulated by eating. During fasting there is no flow. We used to think of the gall bladder as a sort of reservoir which squeezed out bile when it was needed. Rouse and McMaster at the Rockefeller Institute have recently pointed out that the gall bladder has a distinct function i. e. in the concentration of bile. The bile concentrated eleven times within twenty-four hours as measured by biliary pigment values. These experiments were determined in dogs. In the light of these facts why magnesium sulphate thrown directly into the duodenum should improve the symptoms of a cholecystectomised or a cholecystotomised individual is still problematic. I do wish however, that Dr. Meland will be given the opportunity to report to us the further study of this feature of his researches.

DR. CHARLES B. WRIGHT, Minneapolis: I was much interested in the Lyon method of estimating the function of the gall bladder. There is no question but that you can get the most remarkable results from the use of magnesium sulphate. If you inject this, instead of getting the usual yellowish opalescent liquid, you get within a few minutes a beautiful flow of dark bile. You can get the same result with ordinary tap water, and as Dr. Meland has said, you get probably the best stimulus during a meal. During a meal there is a flow of bile and during fasting there is no flow. The question as to whether it is of any therapeutic value to inject the magnesium sulphate is not yet decided. Krohn after careful study decided it was not. If we could perform lavage on the biliary tract it would be of great value. In the treatment of chronic gall bladder conditions, we are often at a loss. We can, by removing the gall bladder, remove the focus of infection, it is true, but if it is an old, contracted gall bladder the adhesions and the damage which has already been done will produce more or less pain, which will not be relieved by the operation. We can relieve the patients of the temperature, chills and infection, but we may not relieve them of a great deal of their discomfort.

DR. SOREN P. REES, Minneapolis: Just a word about the group of cases in which the writer has not found much benefit from operation, the so-called peptic or gastric type of cases. I wonder if that isn't the group in which the gastric tests will help us to avoid an operation which may not help and which in certain cases may set up adhesions that will add to our trouble. I have had the good fortune to be "next door" to Dr. W. P. Larson, Professor of Bacteriology at the University. As soon as the bile was collected by the duodenal tube in sterile test tubes I could put it almost immediately into his hands. We have thus found that in some cases the staphylococcus albus has been present in pure culture. My experience

demonstrates that we can by careful technic secure the bile from the biliary tract by the duodenal tube and demonstrate a specific infection, and that is a great help in deciding what to do in the way of treatment.

DR. H. J. LLOYD, Mankato: I would like to add to what the last speaker has said of duodenal drainage for diagnositic purposes. At our Clinic we make it a practice to do duodenal drainage for diagnositic purposes before any operation on the gall bladder, and it is interesting to find that most of the cases which show the presence of an infection in the aspirated bile, show the same condition in the gall bladder on operation. A failure of properly interpreting the microscopic findings of the duodenal aspirate has been because the microscopic examination of the contents of the fasting stomach has not been taken into consideration. That should always be done first to eliminate any possibility of an infection being present in the upper respiratory passages and from there being carried through the stomach into the duodenal canal, thus interfering with the proper interpretation of the microscopic findings of the duodenal contents.

INTESTINAL POLYPOSIS AND ITS RELATION TO CARCINOMA*

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Intestinal polyposis is a comparatively rare disease, from both a clinical and a pathological point of view, receiving scant attention from the medical literature and still less from the text-books. It was first mentioned by Menzel[1] in 1721 but was then neglected until 1832 when Wagner[2] noted small polypi on the edges of healed ulcers. In 1839 Rakitansky[3] made similar observations and interpreted them as small islands of mucous membrane caught by the cicatrical tissue in the healing of the ulcers. But it was not until 1861 that a comprehensive description of the polypi themselves was given by Lebert[4]. Since that time the most notable contributions to the subject have been given by Doering[5] who collected fifty cases from the literature, and added two of his own in 1907; by Soper[6] who reported one of his own and collected eight in 1916, and by Struthers[7] who in 1920 presented thirty-nine cases from the Mayo Clinic.

During 1921 the necropsies performed at the Miller Hospital yielded two cases of intestinal polypi associated with carcinoma, apparently superimposed upon a single polypus. Both were in males in early middle life and both showed only symptoms referable to the development of the malignant growth and none referable to the polyposis which, in all probability, existed for some time before the fatal complication. One presented the rare finding of the polypi in the small intestine. Neither showed a general inflammatory condition of the mucosa.

Case I: Male, aged 36, gave a history of illness beginning nine months before admission to the hospital, with a dull ache in the abdomen coming at irregular intervals, frequently in the afternoon. This gradually increased in severity and frequency until it became a persistent pain with recurring acute attacks. At last it localized on the right side when a diagnosis of acute appendicitis was made and an operation attempted by his family physician. Instead of an affected appendix, however, a tumor was found in the hepatic flexure, the angle of which was unusually acute. Upon this discovery the wound was closed and the patient brought to Dr. Archibald MacLaren and Dr. H. P. Ritchie. He was admitted to the Miller Hospital on Feb. 25, 1921; the tumor was sutured to the abdominal wound and the bowel drained. On March 7, 1921, the mass was removed. It was about the size of a small orange and, extending into the lumen of the bowel, caused an almost complete obstruction. It consisted of firm white tissue, with an ulcerating mucosa on the surface covered by a foul-smelling purulent exudate. At the highest point of the tumor mass was an adenomatous polypus about 2 cm. in height with an irregular cauliflower-like surface. Gross section showed the base of this polypus to be continuous with the tumor. The microscopic section showed the regular, well differentiated epithelium of the glands of the polypus at one point suddenly changed to the irregular, poorly differentiated, embroyonic, glandular epithelium of the adenocarcinoma comprising the new growth. The patient developed a general peritonitis and died on March 12, 1921.

The necropsy performed four hours after death disclosed six small polypi of various types and sizes distributed throughout the intestinal tract. Some were pedunculated with rough cauliflower-like surfaces. Others were sessile and covered by comparatively smooth mucosa. Four were in the small intestine and two in the large, exclusive of the one removed with the tumor None of these showed any evidence of carcinomatous growth. The intestinal mucosa showed no evidence of inflammation at any point except upon the surface of the tumor and in the polypi themselves.

In all probability this tumor mass represented a

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carcinomatous process beginning in the base of a benign polyp. However, there must be granted the possibility of a carcinoma beginning in the intestinal wall near the polyp and carrying it up on its surface with no histological relationship between them, but such a point is an unusual one for the site of a primary carcinoma.

Case II. Male, aged 38, gave a history of a persistent diarrhea beginning in September 1920, and averaging four to five stools a day, occasionally as many as twelve. There began also about that time a progressive loss of weight and weakness which soon confined him to bed. About March 22, 1921, he had a profuse rectal hemorrhage and was admitted to the Miller Hospital under the care of Dr. E. T. F. Richards and Dr. E. T. Herrmann. He was found to have a secondary anemia, a white count of 11,000 with a normal differential count and a normal urine. A mass could be palpated in the right side of the abdomen but because of the persistent bleeding a rectal examination was not made. He grew rapidly worse and died March 31, 1921.

The necropsy which was performed two hours after death showed an enormously dilated colon, especially the cecum, which was probably the mass palpated. At the junction of the rectum and sigmoid was an annular, markedly indurated, ulcerating tumor causing almost complete obstruction of the bowel at that point. Both above and below, but especially above the tumor mass, were many small polypi almost entirely covering the intestinal wall. These presented smooth surfaces and were covered by intact mucosa. In the wall of the ascending colon, about half way between the cecum and hepatic flexure, was a broad sessile polyp about 4 cm. in diameter. This had a slightly lobulated surface, was soft in consistency, with no induration, inflammation or ulceration at any point, and was covered by smooth epithelium. Metastatic carcinomata were present in the liver, spleen, kidney, and abdominal lympth-nodes.

These polypi as in Case I showed in the center and among the glands many poly-morphonuclear-leucocytes similar to condylomata, thought to arise in response to irritating discharges.

Multiple polypi of the intestinal tract, though considered a rare disease, may often be overlooked, due to the paucity of clinical symptoms produced and the fact that only too often do pathologists neglect to carefully examine the entire lumen of the intestinal tract. Further, carefully performed necropsies and the correlation of the findings, with accurate clinical data, will do much to give this subject the status it deserves.

Intestinal polypi are usually multiple, may be either sessile or pedunculated, and may be mucous, adenomatous or papillomatous in type. Several types may be present in the same individual, as in the two cases here reported. They are most common in the rectum, less common in the colon, and rare in the small intestine. They show a tendency to appear at the points of flexure in the colon. They are usually found in the earlier years of life, according to Doering and Struthers, (about 50 per cent before the age of 35 years) and are more common in males (2:1 Struthers). Some observers have found the condition to be a familiar characteristic. Many polypi become the site of a carcinomatous process, usually in one polyp only but occasionally in several. These carcinomata are much more frequent in the rectum. Although the etiology is as yet obscure, various theories concerning it have been advanced. The older observers suggested that polypi might be the result of islanded, hypertrophing mucosa caught in new forming cicatrical tissue in healing ulcers, but later writers have often found the process unaccompanied by any evidences of old or healing ulcers. Constipation has also been suggested as a cause since polypi are most common in the rectum where the hard fecal material might irritate the mucosa, but since polypi predominate in males, and constipation in females, and since constipation is such a common ailment unaccompanied by polypi, the suggestion has carried very little weight. Yet others suggest a general inflammation, as colitis or dysentery, as an etiological factor, an opinion sustained by Struthers from the Mayo Clinic, and borne out by these two cases with the inflammation present in the polypi. Meyer[8] considered it due to a congenital defect of the intestinal wall with secondary epithelial reaction, a suggestion strengthened by their occurrence in early life and the familial tendency. However, it is hard to believe that congenital defects would be so frequently multiple, would give rise to epithelial reactions of such variable appearance and would predominate in the rectum and colon.

Another theory offered by Lebert[9] is that of chronic irritation due to the constant bacterial and mechanical action of the feces. This theory is strengthened by the facts that the polypi predominate in the rectum where the formed feces would cause the maximum irritation, by

the frequent occurrence at the points of flexure where the mechanical action of the fecal contents is exaggerated, and by the comparative rarity of polypi in the small intestine with its fluid contents and minimal bacterial action. However in that case polyposis should be a more common condition.

The most common complication of intestinal polyposis is intussusception where the offending polyp is often seen and removed at operation, but only too often in such cases just one is removed while its equally harmful neighbor is overlooked, and the process may be repeated later.

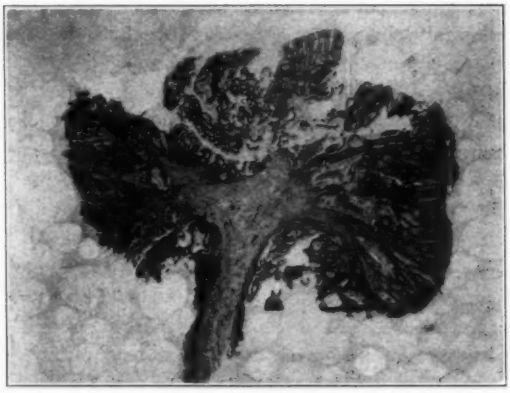

Fig. 1. Simple Polyp.

But a yet more serious complication is that of a carcinomatous process superimposed upon one or more polypi, as found in the two cases reported here. Although it must be admitted that polypi, many of which are unrecognized, may escape such a sequence of events, yet the complication is comparatively common. Ewing[10] states that 50 per cent of intestinal polypi show carcinoma; Doring finds it in 46 per cent; Soper in 43 per cent, and Struthers in 10 per cent. In many cases showing no evidence of malignancy at the time of observation a carcinoma might yet at some later date have developed so that even these percentages may very imperfectly represent the danger of this complication.

The cause of intestinal polyposis, whatever it may be, in all probability bears a direct relation to the carcinomatous change. It is easy to believe that an epithelial hyperplasia, whether primary in response to irritation or secondary to congenital defects, may, when started, easily go on to malignant change. If we accept chronic irritation as a plausible cause it is a very logical deduction that the irritant constantly applied may easily stimulate the epithelial hyperplasia continuously until it breaks normal bounds and forms a malignant tumor. That one polyp alone is usually affected by the carcinomatous process may be due to the fact that it proves fatal before another becomes affected to any marked degree.

We have become accustomed to the fact that carcinoma frequently occur at any point which is undergoing a constant irritation. It seems also very logical that any polyp extending into the intestinal lumen constantly subjected to chemical, bacterial, and mechanical irritation of the fecal material, may become the site of a malignant process. This opinion is farther borne out by the fact that these carcinomata are often multiple, that they may occur in areas not usually the site of a primary carcinoma, and that, as a rule, they occur at an earlier age than the usual carcinomatous process. That polypi occurring in the cervix or nasal passages, even when presenting a similar structure to the intestinal polyp, very rarely become malignant, may be due to the fact that they are not subjected to the bacterial and mechanical irritation of the intestinal canal and do not become hyperplastic.

CONCLUSIONS

(1) Intestinal polyposis is a disease of real importance and is entitled to more detailed ob-

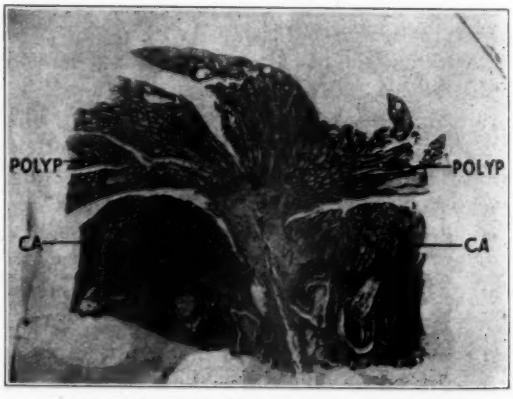

Fig. 2. Polyp superinposed upon a carcinoma.

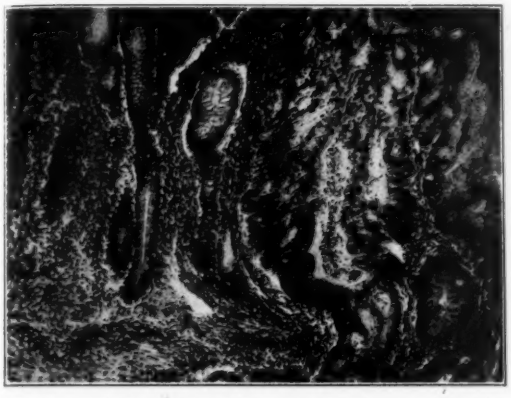

Fig. 3. High power picture at the juncture of the polyp and carcinoma.

servation and study. This can best be accomplished by careful, complete necropsies and correlation of the findings with clinical data.

(2) Carcinomatous change of one or more polypi is a very common complication. Two more of these cases are here added to the literature.

(3) Chronic mechanical and bacterial irritation of the fecal contents of the intestinal canal probably plays a very important role in the cause of intestinal polypi with frequent development into carcinomata.

(4) The polypi may be of various types and situated at any point in the intestinal tract, but they increase in frequency toward the rectum where they predominate.

(5) Intestinal polypi are usually multiple.

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DISCUSSION

DR. ARCHIBALD MACLAREN, St. Paul. I want to say that Dr. Warwick has been a great help to me in showing me how to get postmortem examinations more frequently. Dr. Warwick's success, in her University and Miller Hospital work, in obtaining the consent of the family of the deceased patient for postmortem examination, by her presentation of the good to be obtained has in so many instances overcome the natural aversion, and so much absolute information has been obtained, that I have come to believe that this one weak point in our work can be easily overcome and especially if a competent woman is in attendance. And also I feel that we have in the past let too many opportunities go by because of our failure to get the consent of the friends.

From the postmortem work done by Dr. Warwick for me a great deal of useful information has been obtained, we never speak of a postmortem examination or autopsy because it suggests, and is usually classed among the laity as belonging to murder trials and court work and all sorts of horrors; but we simply say that we wish to examine the body as an aid in helping other suffering people.

I think intestinal polyposis must be quite a rare disease. I have seen it only a few times. Many years ago, I operated upon a man, amputating his rectum, but if I had had a proctoscope and the various other aids, which we have to day, that operation would not have been done, because I only removed a part of his trouble. In this amputated rectum, were a few carcinomatous nodules; later, postmortem showed that they were scattered all through the large intestine.

This man, whom Dr. Warwick reports, died in a very peculiar way. He vomited very violently after his Mikulicz operation. I simply loosened the intestine, brought up a double loop, (the intestine was not opened) and there was almost no chance for this man to develop septic peritonitis in the ordinary way. The intestine was cut off on the fourth day, and the next day he developed symptoms of peritonitis. He had gotten a secondary infection through a tear around the intestine, due to the violent vomiting, leaving an opening, through which the infection from his opened bowel, reached the peritoneal cavity.

CIRCULATORY DISTURBANCES OF THE FEET*

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It falls to the lot of the orthopedic surgeon to see a great many cases of foot complaint. Thanks to widely advertised foot plates, "arch supports," as well as loudly heralded brands of shoes designed to cure, as by magic, all "foot ailments" nearly all cases of foot trouble arrive at the physicians office having tried one or more of these cure-alls.

It is a matter of fact that there exist a multiplicity of foot ailments which may attack previously normal feet and which are apart from the condition of weak foot (more commonly and erroneously known as "flat foot") for which these mechanical supports are designed. In this connection one need but mention as examples the arthritic conditions of the feet, the large list of infections of the bones and joints, the cases of bursitis and exostoses; and the results of trauma to the various structures of the feet.

A not very frequent cause of foot complaint is disturbance of the circulation of the feet. And this condition is never recognized by the shoe clerk and sometimes, forsooth, not even by the physician. The reason for the latter fact is that there exists little in the literature on this subject and what exists is often confusing. A considerable amount of terminology has arisen which often overlaps and sometimes only names certain phases of the diseases in question—witness the names: myasthenia angiosclerotica, intermittent claudication, thrombangitis obliterans, endarteritis obliterans, "spontan gangran," erythromelalgia and others. Some of these names are based on pathological anatomy; others on the symptomatology.

It seemed timely, therefore, not only to call attention to a group of often overlooked foot conditions but also to attempt to classify the various types of circulatory foot disturbance in as simple a manner as possible and as the facts seem to warrant.

*Presented before the Minnesota State Medical Association, Duiuth, Minn., August 1921.

As to the circulation of blood in the feet we must remember that the feet are far away from the heart; that, with the upright posture of man, there is a mechanical disadvantage and difficulty for the venous blood to get back to the general circulation. We will recall that in cases of freezing, the feet are more often more seriously affected than the hands though usually better covered; also that it is difficult to inject the arteries of the feet in a cadaver. Any interference with the circulation of the feet means interference with the oxygen and food supply to the structures of the feet. We must finally remember that human feet are much used organs. It is not surprising that they should register complaint in the form of ache and pain, if their air and food supply are interferred with.

This paper is a result of the study of 67 cases seen in private practice taken from 500 consecutive cases of "foot complaint." There were 34 men and 33 women; nearly all cases were of middle age or past. As to nationality they were American (38) Jewish (21), German (2), Scandinavian (4), Austrian (1), French (1).

Circulatory disturbances of the feet may be due to interference with the venous or arterial systems. In three cases there was evidence of a combination of the two.

Veins.—We need not spend much time discussing this phase; all cases consisted of varicose veins. There were 23 cases in this series. There was evidence of weak foot in 16, bunion in 3, metatarsalgia in 1. These cases came for treatment of pains in the feet and it was important to recognize the presence of the varicose veins and treat them.

Arteries.—In this series there were 42 cases; 29 male; 13 female; nearly all of these cases ranged between 45 and 65 although there was one case in a girl of 14. Nationality—Americans (27), Jewish (13), German (1), Scandinavian (1). It is well known that the Jewish race is peculiarly prone to this form of foot disorder. As will be noted however the majority of the cases occurred in Americans and this is probably due to the fact that there does not exist as large a proportion of Jewish population in the Northwest as in some other sec-

tions of the Country. A considerable number of these cases were of the "nervous type."

Etiology: It is well nigh impossible to trace back the exact etiology in a given case. A certain number of these cases are no doubt congenital, the blood vessels being small, but the toxemias can probably be held responsible in a large majority of these cases. In our series they were divided as follows: tobacco (8), alcohol (1), excessive coffee drinking (4), syphilis (1), diabetes (1). A certain number of cases can, I believe, be ascribed to prolonged exposure to severe cold (7 of this series give a history of outdoor winter work). Three cases give a history of injury. In one of the most marked cases a gunshot wound had destroyed the poplitical artery causing the foot to be pulseless and the tissues of the foot to be of low vitality, painful and prone to infection.

Symptoms: The symptoms of these cases show that there is withheld from the tissues either the oxygen or the food supply or both. I have occasionally referred to this as "arterial hunger." These cases complain of pain which is variable. Nineteen complained of pain on moderate use; 7 on over use; 15 cases complained bitterly of pain at night (night pain seems to be quite characteristic of arterial disturbance). In 8 cases the feet were exquisitely tender; 10 complained of more or less constant swelling; 10 cases said that the wearing of braces increased the pain; (this, by the way, seems to be another fairly characteristic feature in most cases). There was a tendency to involvement of one foot only in 6 cases; 10 cases complained of cold feet and said it was difficult to keep the feet warm even in bed; 6 complained of numbness of the feet; in 10 there was present a distressing burning sensation; 2 complained that the feet "go to sleep" easily; in 2 cases there were cramps on very slight exertion.

Objective symptoms: On examination there was occasionally little to be found; the feet were often somewhat cyanotic; sometimes slightly edematous. The most important symptom is the absence of the dorsalis pedis pulse. In all of these cases no pulsation could be found in the dorsalis pedis artery and in the large majority of cases it was absent in both feet; in more marked cases it was also impossible to detect any pulsation in the posterior tibial artery.

Complications: The following complications existed in the 42 reported cases of arterial foot trouble; gout (1), bunion (1), pes planus (10), ganglion (1), periostitis (1), metatarsalgia (3), neuritis (1), arthritis (4).

Classification: I know of no attempt at classification of these arterial lesions of the foot and believe that for this reason there exists so much confusion in the nomenclature. I wish to present the following classification for I believe that these cases can be placed in four groups:

(a) Congenitally small arteries,
(b) Arterial spasm,
(c) Arteriosclerosis,
(d) Thrombangitis obliterans.

(a) Congenitally Small Arteries: The subjoined case as well as two others similar and not necessary to report here makes me believe that at times the arteries of the foot are too small for their appointed task of conveying food and air supply to the feet; in no other way can I explain such cases.

Case Report: (Case No. 1100) V. H., aged 14, female, complains of right foot. F. H. and P. H. negative. Trouble began May 1913, onset gradual. No history of injury. Went to school until December, 1913. During the last few months used a cane. About a month ago, began using crutches. In July 1913, two months after the onset of this trouble, patient stepped on a thorn which entered the foot at the base of the second and third toes. Foot does not pain very much at night, although patient sleeps restlessly; however this is due more to general restlessness rather than to pain in the foot. Patient has fainting spells every two or three weeks. Other joint trouble denied excepting that patient says occasionally her hands get "white and cold" and, at such times, she can not use them; the hands stay this way for ten or fifteen minutes. This happens very frequently when patient gets chilly. Patient says she has occasionally noticed a red area (pointing to the region of the first metatarsal bone). Says that the foot is sometimes swollen a great deal more than it is today. Examination: There exists slight swelling over the internal surface of the right foot from the base of the first metatarsal to about the astragalo-navicular joint. The foot is slightly cyanotic, although the circulation is also rather impeded on the normal side. The foot is exquisitely tender. The foot is cold. The dorsalis pedis artery cannot be made out on the right side; on the left side it is barely perceptible.

(b) Arterial Spasm: (14 cases) These are perhaps the most interesting of the cases reported. The symptoms are, as mentioned above, those of local anemia. The condition is usually bilateral. The patient may be free from pain for considerable periods of time only to have it return either without cause or on exposure to moderate cold or after slight or moderate exercise; there may be burning pain; pain occurs in the various portions of the foot; pain in the calf musculature. The feet may cramp and "go to sleep" easily. The sensation of coldness in the feet is a frequent symptom. The pain is often increased by the use of a brace or arch support; the feet are often tender and during a painful "attack" there may be pallor and the patient may limp at times. On examination the feet may be normal; there may be pallor or slight cyanosis. On palpation it is impossible to detect the dorsalis pedis artery or any pulsation in it. In these cases we often get the history of overuse of tobacco or coffee; occasionally one can make a fair preliminary diagnosis before the patient removes his shoes simply by observing the following points: Semitic gentlemen of rather past middle age whose complaints are as outlined above and who carries in his hand a big black cigar; investigation will disclose that he smokes from 12 to 20 of these cigars per day.

Case Report: (Case No. 829) M. O. G., Jewish, male, aged 58, complains of both feet. F. H. and P. H. negative. For the past 3 years both feet, especially the left one, began bothering; pain in sole, in arch, up heelcord to calf of leg, varying. There never existed any tenderness about the feet; no pain at night. The chief trouble seems to consist in that after the patient has walked three or four blocks a certain amount of cramping takes place. During the past few months he says he has noticed a numb sensation at the ends of the toes, especially of the right foot. This also happens chiefly after moderate use of the feet. Patient has tried arches which have given considerable discomfort and therefore he has discontinued them. Has been wearing warm socks to bed for past few years. Says his feet get cold easily in bed. Examination: No atrophy of leg musculature; no sinking of either arch; slight callosities under the anterior arch of both feet. None of the arteries going to the foot can be felt. The ends of the toes are cold. No discoloration.

Case report: (Case No. 2954) H. B., Jewish, male, aged 39. Complains of right foot. F. H. and P. H. negative. For the past 5 or 6 months pain in right foot of indefinite character; this pain comes in spells and occasionally leaves absolutely for a week or two, when it returns, lasting a week or two; pain gradually getting worse; numbness about foot; during the past 4 or 5 weeks patient has noticed "white spots" (localized anemia); foot gets cold easily. Examination: The right foot is slightly colder than left foot otherwise no physical signs except that the dorsalis pedis pulse is absolutely absent.

(c) Areteriosclerosis of the feet: (23 cases). The arteries of the feet may be the earliest in the body to show pathological changes in the vessel walls. The symptoms are similar to those enumerated above but usually more persistent and sometimes more severe. On palpation the dorsalis pedis artery is found to be hard and usually pulseless. X-ray often shows calcareous deposits.

Case report: (Case No. 659) D. H. D., aged 47, male, American. Complains of right foot. F. H. and P. H. negative. Two years ago patient experienced some trouble with the right foot. Pain in arch, which remained for some weeks, caused patient to limp. This cleared up and remained O. K. until Nov. 1916, when patient had a second attack very similar, only worse. The pain this time extended up the leg and hip, right foot only affected. About ten or twelve days ago, right foot suddenly began paining in the arch of the foot (plantar surface). Foot gets cold easily. Toes are always colder on right foot than on left. Has much pain at night. Foot has not swelled. Has not been discolored, excepting when patient is standing or the foot is hanging down, at which time the foot becomes cyanotic. Examination: Dorsalis pedis artery absolutely absent; toes cold; feet cyanotic when pendant. Very tender under heel and anterior to the heel on the plantar surface of the foot. Motions of ankle normal. No swelling. Patient uses crutches.

(d) Thrombangitis obliterans: (2 cases) This disease is I believe, rarely seen in the Northwest as it most frequently affects the Jewish race. It is therefore frequently observed in parts of Europe as well as in New York. Frauenthal of New York has observed many cases and described them. The best work on this subject has been done by Burger. There is a question whether or not this condition does not simply represent the final stage of some of the cases of arterial spasm and arteriosclerosis. The patients are in a pitiful condition and give a history of prolonged suffering usually in both feet, including many of the symptoms of "arterial hunger" as mentioned above. On examination there may be gangrene of the toes and even of the foot. The disease is usually progressive and amputation is often necessary.

Burger has shown that there exists cases of extreme thrombosis of the arteries of the foot extending sometimes well up the leg. The disease is "idiopathic."

Case Report: (Case No. 1159) D. R. K., male, aged 50, American. F. H. and P. H. negative. Patient began having trouble with feet about ten years ago; pain in forefoot of both feet; get cold easily; occasionally get numb; pain at night severe. About 4 years ago patient noticed that foot occasionally became discolored "blue;", 3 years ago patient stubbed his toe and a sore developed which did not heal, finally necessitating the amputating of toe on left foot; later another toe on left foot became diseased "by itself" and had to be amputated. Present complaint; for past 2 or 3 years patient complains of right foot acting similar to left and for the past 3 months an open sore has existed on the 3rd toe which refuses to heal. Examination: Well developed man; forefoot of both feet marked cyanotic; two toes missing on left foot. On the right foot there exists an ulcer on the dorsum of the middle toe which is deep and in fact involves the interphalangeal joint. Circulation of both feet involved; dorsalis pedis artery cannot be felt in either foot. Diagnosis: thrombangitis obliterans.

Case report: (Case No. 3410) D. G., Jewish, aged 34, male. Complains of both feet. F. H. and P. H. negative. Began some months ago evidently with a hammer toe of the second toes of the right foot. Corn developed on this which was operated on by somebody and he has had a running sore ever since. Has gone to several physicians who have failed to cure the foot. Both feet however have been giving patient considerable trouble for past six months or so. Pain in front part of both feet. Examination: There exists an ulcer on the dorsum of the second toe which goes down to the bone. The circulation of the right foot is absolutely impeded. The entire forefoot is blue and somewhat edematous. Dorsalis pedis artery as well as the posterior tibial cannot be made out. The left foot looks about the same as the right.

Treament. The treatment seems about alike for these various arterial conditions. It is largely symptomatic but the careful attention to treatment often relieves the patient of most and, occasionally, of all pain. Of drugs sodium nitrite and potassium iodide may be tried. Alernate hot and cold foot baths often relieve and are of great value. Woolen stockings for day and night are to be recommended. Abstainence from coffee and tobacco is important. Heliotherapy is followed by good results in some cases. Rest to the feet is of course indicated.

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DISCUSSION

DR. J. R. KUTH, Duluth: I wish to compliment Dr. Geist, first, on the choice of subject, and second, on the very interesting and thorough manner in which he has presented it. Undoubtedly a great many of these cases are vascular in origin and have been proven so fairly definitely. It is, however, a question in my mind whether some of these cases may not be of neural origin rather than vascular. I have seen several cases of Raynaud's disease, and they resembled in may ways some of these cases. In general the spasms are more marked, the condition is less chronic, and many of them associated with other nervous disturbances. I believe that the cases of nerve origin may resemble some of these cases to a marked degree.

Some years ago I had occasion to examine a twelve year old girl who, five years previously, was hit in the lower back by a switch engine. She presented a marked deformity in the lumbo-sacral area. She complained persistently of low back trouble. She gave a history for a year or two previously of having recurring cramps in the great toe. During an examination she suddenly got up and grabbed the great toe, and it was found to be perfectly blanched and cramped. This was not a frequent manifestation, but I do believe it was definitely nervous in origin.

In the army one had a good opportunity of seeing many cases in which there was mild congestion with burning pain following definitely on nerve lesions, especially of the sciatic nerve, a condition of causalgia. They resembled a little bit these conditions. One must make up his mind whether or not some of these cases are not primarily of nerve origin rather than vascular.

DR. M. S. HENDERSON, Rochester: I also wish to compliment Dr. Geist on tackling another new field. Out of 500 cases, he shows that 12 per cent are due to circulatory foot disturbances, so that the subject is sufficiently important to warrant our considering it.

His classification of cases covers the field well. We see these cases in all stages. Some come to us complaining of indefinite pains in the foot and then we see them late in the disease when gangrene is present. So it is extremely important to take these people in hand and treat them early.

Dr. Geist did not mention focal infection and it is possible that a focal infection is a factor in a certain group. Occasionally we have a patient come in complaining of indefinite aches and pains but chiefly in the feet. We find nothing particularly wrong and it is not until we examine the urine and find sugar in it that we realize these patients are diabetics. There is not much to say about treatment except we have advised duodenal lavage and the injection of Ringer's solution and we really have accomplished very little. In the late cases where gangrene has taken place we have to amputate, and amputate high. Now I usually recommend amputation of the thigh where I formerly used to go below the knee.

CEREBROSPINAL ARTERIOSCLEROSIS*

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Those of us who are fortunate enough to escape death from the multitude of infectious diseases and other accidents to which man is heir, will ultimately succumb to a process of disintegration, of which arteriosclerosis of the nervous system is a frequent expression. A case exemplary of this disorder is as follows:

Mr. T. (Case 257266), aged fifty-two years, presented himself at the Clinic January 21, 1919, complaining principally of incontinence, which had been growing worse for two years. Coincident with this was a general failing of strength and the development of a tremor in the legs. One year before, he had begun to have dull, heavy headaches and a sensation of having his hat on. His friends noticed that his memory was failing. He left the harnessed horses to stand in the field all night, and forgot to take off their bridles when they were to eat; he expected to dine shortly after a meal was over, and gave his children's ages incorrectly. He became dizzy easily, often fell asleep during the day, and was confused in a crowd. At night he interpreted the rumbling of horses over a nearby bridge as thunder, and often became lost in his own house after he had been lying down.

The Wassermann reaction on the blood was negative. The renal functional tests were normal. The prostate was enlarged slightly; there were slight retinal arteriosclerosis and neurologic evidence of a subacute combined sclerosis of the spinal cord of arteriosclerotic origin.

Arteriosclerosis is not peculiar to old age; it may occur at the age of twenty years. Smith found that deaths occur from cerebral vascular disorders at an average age of sixty years, while apoplexy with hemorrhage and hypertension occurs about ten years earlier. The cause is said to be toxic. Josues first attempted to produce it experimentally by the administration of epinephrin and hydrastin. Saltakow believed he could produce it by the injection of staphylococci. If these experiments are verified, arteriosclerosis may eventually be added to the list of disorders that result from focal infections.

The pathologic changes coincident with arteriosclerosis are generally understood. The difficulty in diagnosis lies in the correlation of such changes with the clinical expression of the disorder.

Figure 1 is a photograph of some of the larger blood vessels dissected from a brain. The basilar artery, the circle of Willis, the lenticulo-striate and lenticulo-optic arteries, the usual site of hemorrhage, are shown clearly. Unfortunately, the atheromatous areas are not so well shown; in the basilar artery, however, an enlargement that marks the site of almost complete obstruction of the vessel may be seen. The vessel walls are often greatly thickened (Figs. 2 and 3), particularly the intima, which may ulcerate and liberate emboli, thus causing paralytic strokes. The thickening may eventually completely obliterate the lumen of the vessel. The resorcin-fuchsin stain shows the splitting of the inner elastic membrane. Atrophy and regressive metamorphosis of senility may be seen instead of thickening; the wall of the vessel may become extremely thin and is then ruptured easily.

The lesion in the cord is a diffuse degeneration of the posterior and lateral columns constituting a type of combined sclerosis.

Increased intracellular deposit of pigment is common and has been looked on as a cause of death due to interference with cellular metabolism. A number of such cells may be seen in Figure 4. It would be more consistent to interpret this as a coincident expression of senescence rather than the cause of it.

One hundred forty-six cases of cerebrospinal arteriosclerosis examined in the Section on Neurology of the Mayo Clinic during the last year form the basis of my analysis. In 40 per cent of the cases there was objective evidence of spinal cord involvement. Inasmuch as these cases presented also all phases of the cerebral type of involvement, and since evidence of cord involvement strengthens the diagnosis, they were selected for detailed study. The average age of the patients was sixty-three years, the

*Presented before the Minnesota State Medical Association, Duluth, Minn., August 1921.

lower and upper extremes were fifty and seventy-eight years respectively. Males predominated (64 per cent). Vertigo was the most common complaint (57 per cent); it was very distressing in 11.8 per cent. Mental impairment was next in frequency. Headache was often present and very characteristic. It was often described as a sensation of pressure or weight and was bregmatic or frontal; sometimes it was intense, stabbing, and sharply localized. Patients often complained of trouble in walking; this was usually due to weakness, ataxia, or spasticity. Irritablity is considered a common sympton; however in this series many of the marital partners stated that the patients were decidedly less irritable than they had been during health. Tinnitus is common and furnishes corroborative evidence of widespread involvement.

The epilepsy of arteriosclerosis differs in no essential respect from idiopathic epilepsy. Often the attacks are attributed to being "overcome by the heat," although the day may have been relatively cool. One man came because of repeated "sun-strokes." Strokes of various kinds, such as hemianopic, hemiplegic, and aphasic, are severe and incapacitating complications; ordinarily, however, too much importance is attached to them as requisites in making a diagnosis of cerebral arteriosclerosis. They occurred in only 3 per cent of my series.

The diagnosis of cerebral arteriosclerosis does not represent merely an impression based on the history and the general behavior and appearance of the patient. Some help is gained from a careful examination. Pupillary irregularity and poor reactions to light and accommodation may often be noted. Since inspection of pupils has become such an important procedure in the detection of syphilis, the interpretation of pupillary anomalies in senile persons must be made with extreme caution. An examination of the fundus must never be neglected, since retinal arteriosclerosis always means an associated cerebral arteriosclerosis; the reverse, however, is not necessarily true. Hearing, tested with the watch, is often found to be impaired. Patients hear a watch either not at all or at but a few centimeters from the ear. Touch, pain, temperature, and vibratory and joint sensibility may be impaired over the lower portion of the body. The patellar reflexes may be absent or unequal; usually the Achilles reflexes are either absent or unequal. The abdominal reflexes were absent in 66 per cent of this series. A positive Babinski reflex after one year of age is practically always indicative of an organic lesion of the central nervous system. A finding of the greatest import-

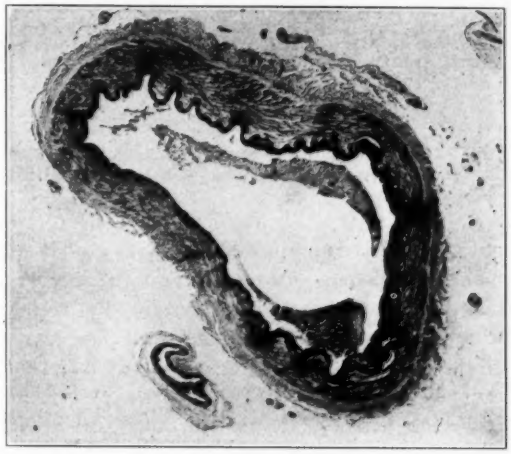


Fig. 2. An arteriosclerotic blood vessel stained with Weigert's elastic stain. Splitting of the inner elastic membrane is shown.

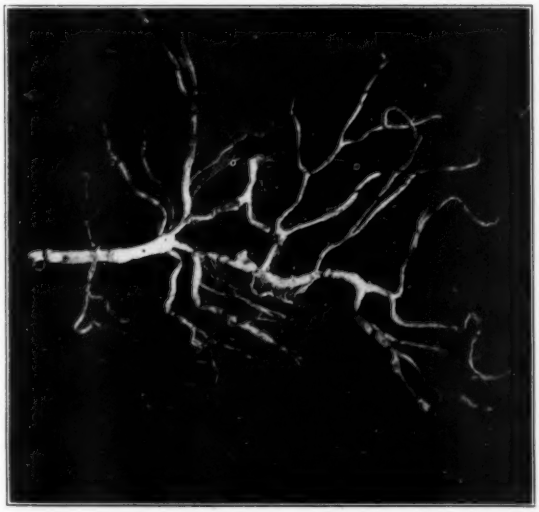


Fig. 1. Some of the larger blood vessels dissected from a brain showing marked arteriosclerotic changes. The circle of Willis is shown in the center.

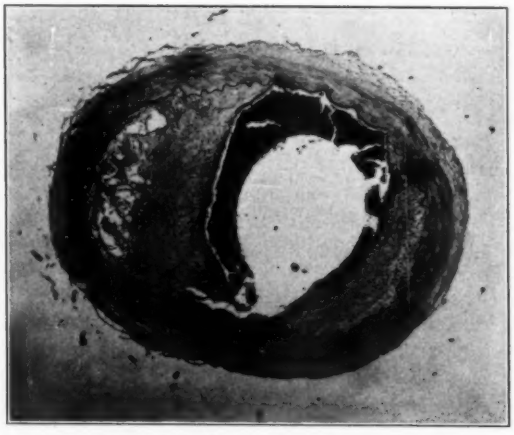


Fig. 3. Weigert's elastic stain. Cross section of an anterior cerebral artery showing marked intimal thickening.

ance, which is manifested in a very striking manner, is poorly sustained attention; this was noted in 62 per cent of patients of the series. The patient must be reminded again and again of the fact that he is being examined and that the point of a pin differs in certain respects from the head. Testing vibratory sensation, which requires full cooperation and fine discrimination, often must be abandoned. The resemblance of symptoms of arteriosclerosis of the nervous system to symptoms of frontal lobe tumors, particularly in the absence of choked

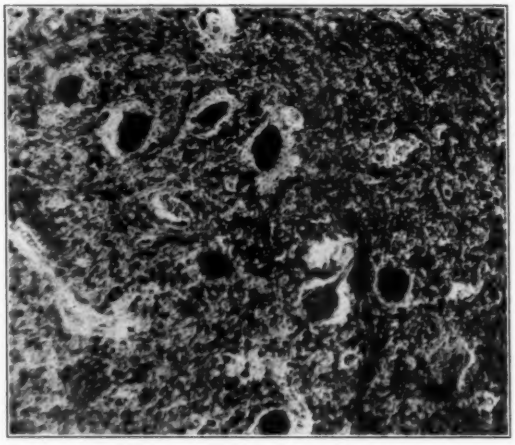


Fig. 4. Ganglion cells from the spinal cord in a case of arteriosclerosis, stained with Sudan III and methylene blue. Intracellular deposit of pigment is well shown. One of the ganglion cells near the center of the field is almost normal.

discs, is sometimes so striking that differentiation may be quite impossible.

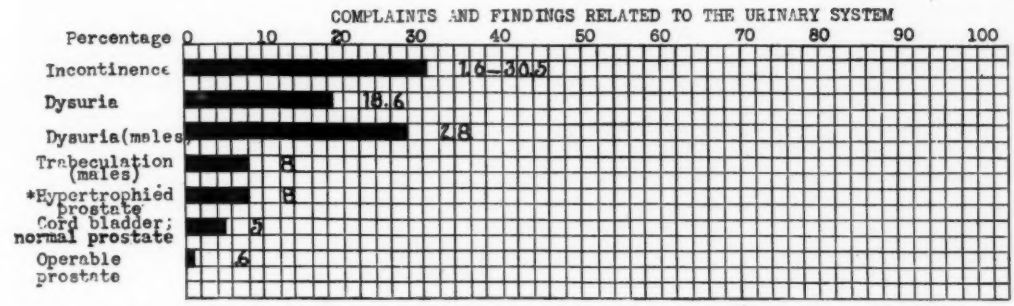
Unlike hemorrhage into the brain, hemorrhage into the cord, or hematomyelia, is rare. It does occur, however, and may cause a clinical picture as follows:

Mrs. A. K. (Case 154978), aged fifty-one years, who had suffered for some time from an extreme hypertension, suddenly developed complete paraplegia. Hot bottles were placed around her lower extremities, and she was very seriously burned and blistered by them before it was discovered that her lower extremities were without sensation. The sphincters were incontinent. The level of the anesthesia reached approximately to the level of the umbilicus. Several secondary infections and bedsores developed and the patient died.

Occasionally the peripheral nerves take part in the process, not nearly so frequently, however, as in pernicious anemia, a fact well demonstrated by Hamilton and Nixon.

Complaints relating to the urinary system are common (Fig. 5). In this series cystoscopic examinations were made when indicated, and trabeculated bladders were found in 8 per cent of the patients. Rectal examinations were made of all, and hypertrophied prostate was found in 8 per cent. Only one patient, however, had an enlargement sufficient to account for the symptoms and the trabeculation of the bladder. Operation in this case was followed by relief of symptoms. Obviously in these cases there is a fine balance between the cord as the cause of the trouble on the one hand, and the prostate as the cause on the other; both must be taken into consideration, otherwise surgery may be followed by far more distressing symptoms than those for which the patients primarily seek relief.

The relation between high blood pressure and cerebrospinal arteriosclerosis does not appear to be generally understood. The systolic and diastolic blood pressure curves shown in Figure 6 were constructed on differences in pressure of 10 points. Objection is often raised to the diagnosis of cerebral arteriosclerosis on the ground that the blood pressure is normal. The fact remains that 64.4 per cent of patients have a mean pressure of 130 mm. systolic and 78 mm.



*Enlargement was not sufficient to account for the symptoms except in one case of benign hypertrophy; operation was followed by improvement.

Fig. 5. Incidents of complaints and findings relating to the urinary apparatus in cases of cerebrospinal arteriosclerosis.

diastolic. Doubtless the lack of elasticity of vessels is responsible to a large degree for the low pressures. The same relationship is said to exist in peripheral and in cardiac arteriosclerosis.

In closing, a word might be said with regard to the prognosis. It seems to be the prevailing conception that arteriosclerosis of the nervous system is a terminal condition, and if a patient has been given this diagnosis, nothing but death is left for him; and that if he has had one stroke, he has only to await another. It is true that the condition may terminate in this manner, but the patient must not be placed in fear of expecting every day to be his last. Marked improvement may result if habits of living are corrected, as by a daily noon-day nap, and interest in life reawakened.

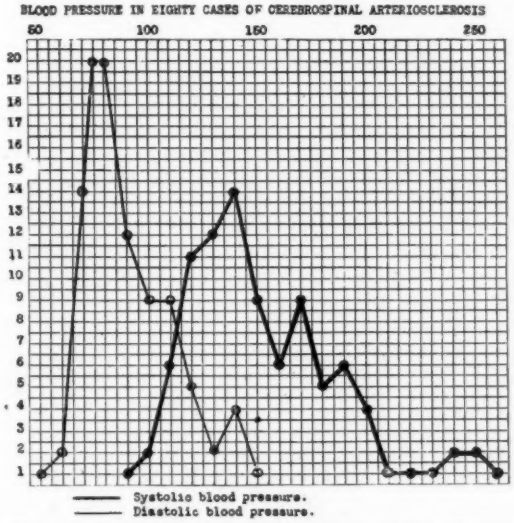


Fig. 6. Diastolic (light line) and systolic (heavy line) blood pressures in patients having cerebrospinal arteriosclerosis. The number of patients is shown on the left, the blood pressure is indicated above. Practically normal blood pressures are shown in patients with arteriosclerosis of the nervous system.

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DISCUSSION

DR. E. M. HAMMES, St. Paul: In listening to Dr. Woltman's paper, three points impressed me: first, the age incidence; second, the absence of hypertension in a large percentage of his cases; and third, many of these cases have arteriosclerosis primarily in the central nervous system without any demonstrable clinical evidence in the general arterial system.

I am sorry Dr. Woltman did not lay more stress on the age incidence. Cerebro-spinal arteriosclerosis does occur in very young individuals. Schlosser reported a case with post-mortem findings at the age of fifteen. We had a patient of nineteen, under observation, who was a regular neurological museum. He was referred to us by Dr. Strobel of Welcome, Minn., because of a marked post-diphtheiritic neuritis. Along with this he had a cerebellar tumor. Post-mortem revealed a tumor in the right cerebellar lobe, with most marked arteriosclerosis of the cerebral blood vessels, especially the circle of Willes.

Regarding hypertension, many of these patients have a normal or even subnormal blood pressure.

Occasionally, one sees a young individual presenting the picture of a cerebral thrombus, embolus or hemorrhage. In the absence of any positive findings, such an endocarditis, postoperative conditions, syphilis, renal disease, etc., one must always bear in mind the possibility of an early cerebral arteriosclerosis. We usually associate cerebral arteriosclerosis with hypertension. However, cerebral hemorrhage can occur in primary cerebral arteriosclerosis with a normal or even subnormal blood pressure.

Dr. Woltman spoke of the difficulty of differentiating the pupillary reflex changes in these cases from the Argyll-Robertson pupil. I would like to ask Dr. Woltman if he refers to the senile pupil or if such pupillary changes also occur in the young adult with cerebral arteriosclerosis?

DR. E. L. TUOHY, Duluth: This subject deserves very careful attention, and Dr. Woltman is to be congratulated on making it so clear. The contention that you may have cerebral arteriosclerosis without changes elsewhere in the body is unquestionably correct. On the other hand, studying the patient from the broader point of view of the internist, I have been impressed again and again with the importance of linking up symptoms constitutionally with changes that might be attributed to cerebral vascular changes. There is also the need of a more common terminology, and of the necessity of restricting the use of certain terms. To Allbutt is due a great deal for making reasonably apparent what is meant by senile changes. It is probably true that an individual may be senile at the age of fifteen or twenty, but there is a great difference between the condition termed "athersoclerosis" (Allbutt) and those changes accompanying hypertension. Granted that this is true, rather than loosely judging some conditions and saying it is due to arteriosclerosis, we should restrict ourselves definitely to what we can show objectively. Dr. Woltman's chart showing the pupillary variations with the condition of the retina and the changes that he can demonstrate in the retina is very interesting, but we should go further. We have made studies of the legs with x-ray plates so as to show the changes in the tibial artery, and we should mark well the general muscular tone and nutrition.

In connection with extra nourishment and rest in the middle of the day, and the other measures he speaks of, if assiduously carried out, patients will often regain their weight and their muscular tone.

I have seen a definite correlation between true angina cases and those showing vascular cerebral changes (tinnitus aurium, vertigo, etc.).

We would profit greatly if a greater insistence upon a definition of terms were made and a common terminology adopted. Dr. Hammes is wrong in stating that a person will not have cerebral hemorrhage in the absence of hypertension. This, I am sure, has occurred repeatedly in individuals with normal tension, tension that has been normal for many years, but in whom there is an inherent weakness in the blood vessel itself. Much confusion has arisen from the erroneous statement that arteriosclerosis means increased tension. Superimposition of different processes causes confusion. Primary kidney disease or chronic nephritis will be followed by hypertension. So called essential hypertension and "kombination form" nephritis are relatively frequent, but primarily the process discussed by Dr. Woltman concerns intimal atheroma, and has nothing to do with hypertension.

I would like to ask Dr. Woltman about the symptom of tremor as associated with cerebral vascular changes; he did not include it in his table.

DR. MOSES BARRON, Minneapolis: I was intensely interested in the paper and its discussions.

I recall the case of a young girl, thirteen years old, who died of cerebral hemorrhage, on whom I perpormed the autopsy. The examination revealed advanced atherosclerosis of the arteries, which was especially marked in the cerebral vessels. Some of the branches were almost completely closed. The blood clot in the brain was as large as the child's fist. The child had shown some mental disturbances previously, having been depressed a great deal, and having sat around moping a great portion of the time. Unfortunately the doctor in charge had not taken the blood pressure, since the condition had not, at all, been suspected. Death occurred very suddenly. Cases of severe atherosclerosis in children, especially of the cerebral vessels, are not so infrequent in the literature as one would suppose.

The relation of hemorrhage to hypertension has well been brought out in the discussion. I do not believe, however, that it is necessary to have high blood pressure in order that a cerebral hemorrhage may obtain. I believe that hemorrhage can occur whenever there is a disproportion between the tensile strength of the blood vessels and the blood pressure inside. Cerebral hemorrhage does occur in cases in which the blood pressure lies within the normal limits, provided the cerebral vessels are sufficiently weakened through disease. In such a case, the rupture of the vessel-wall occurs exactly in the same manner as in cases of marked hypertension, with only moderately diseased vessel-walls.

DR. HENRY W. WOLTMAN, Rochester (Closing): I cannot say whether or not the "senile pupil" is seen in young persons. It was not present in the few I have seen of arteriosclerosis in young persons. Differentiating the senile pupil from the syphilitic pupil seems to be difficult only in older persons.

I am glad Dr. Tuohy pointed out the necessity of differentiating so-called essential hypertension from arteriosclerosis. That the two conditions are quite distinct, is apparent from the neurologic side alone. It did not occur to me that Dr. Hammes thought that hypertension is necessary before cerebral hem-

orrhage occurs, and he tells me this is not what he meant to say.

The tremor is more a shaking than a tremor. It is fairly rhythmical and very often involves the head as well as the hands. It is quite different from the tremor seen in multiple sclerosis or paralysis agitans.

HYSTERICAL DYSPHAGIA*

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Many references are found in medical literature to various hysterical manifestations, but I have been unable to find a description and discussion of a group of cases in which a hysterical inability to swallow is the predominating and sometimes the only symptom. From the records of the Mayo Clinic I have been able to collect sixty-nine such cases. Fifty-seven of the patients were females, and twelve were males. Patients having the ordinary "globus hystericus" are not included in the series, since they rarely, if ever, have any definite obstruction to food and none of them shows the marked nutritional disturbances seen in many of the patients selected for study.

The dysphagia usually began suddenly and in many instances the patients dated the onset of their symptoms from a time when they choked on a piece of solid food, the point of obstruction being high in the throat. This was followed by an inability to swallow solid food, particularly meat and green vegetables, and difficulty in swallowing pills or capsules. Liquids and soft foods were usually taken well, and the loss of body weight was not marked. A moderate or marked secondary anemia developed, probably due to the quality of the food taken.

Thirty-seven of the patients had a hemoglobin of 60 per cent or under; the lowest was 27 per cent. Enlargement of the spleen, usually quite marked, was noted in twelve cases. The duration of symptoms varied from one month to twenty-five years. Anemia was more liable to be present in cases in which the history of dysphagia was long standing. Roentgenographic examinations were made in all the cases with negative results; and esophagoscopic examinations that were made revealed no lesions.

TREATMENT

The treatment consisted in passing a plain esophageal sound, the size immaterial, into the stomach, guided by a previously swallowed silk thread. The treatment was purely suggestive as there was no real stretching of the esophagus. The patients were encouraged to eat solid foods, and were given Blaud's pills and Fowler's solution. Usually nothing further was necessary to bring about an immediate temporary cure. The blood picture improved at once, and if symptoms did not eventually recur it became normal. The spleen returned to normal size.

Prolonged observation of many of these patients demonstrated gratifying results. Recurrences, which may occur unless the patients are constantly reassured with regard to their condition, are usually in patients who have other hysterical manifestations. In case of recurrence a second passage of the sound will relieve for an indefinite period of time.

Hysterical dysphagia must be distinguished from all lesions producing dysphagia, but the lesion of fairly frequent occurrence with which it might easily be confused is a slow growing carcinoma at the introitus. The long duration of symptoms with absence of obstruction to the sound is usually enough to determine the diagnosis. In case of doubt, an esophagoscopic examination can be made without trouble.

An interesting feature in these cases is that after the dysphagia is relieved and food is being taken freely a moderate degree of hypothyroidism may develop, necessitating the regular administration of thyroxin. Plummer, who first pointed out this complex of dyspagia, without organic obstruction, anemia, and enlargement of the spleen, suggests that during the long period of inanition a light demand for thyroxin results in a disuse atrophy of the thyroid and hence following the relief of the dysphagia, the thyroid may not be able to meet the demand of the body.

CONCLUSIONS

1. Although hysterical dysphagia is a functional disorder, the prolonged unbalanced diet

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gives rise to enlargement of the spleen and secondary anemia.

2. Normal deglutition can be restored by passing an esophageal sound.

3. Recurrences are liable to occur, but can be relieved by further passage of sounds and by constantly reassuring the patient.

4. When normal deglutition is restored, the blood picture returns to normal, and the splenic enlargement subsides.

5. Hypothyroidism may develop after the patient begins to swallow freely, due to the inability of the thyroid to furnish secretion enough to care for the increased food intake.

DISCUSSION

DR. R. RIZER, Minneapolis: This is a very unusual picture. Outside of the Rochester Clinic, there are no other people in medicine today who have found the syndrome. Dr. Plummer was the first to recognize this condition, and Dr. Vinson has carried on the work. As Dr. Vinson has said, the time of the appearance of symptoms and the pathology have not been found to be correlated. One lady with a hemoglobin of thirty per cent was dilated, and improved a great deal. The dysphagia disappeared, and the spleen, which had been enlarged, could not be palpated. The lack of food had so changed her metabolic rate that her condition suggested hypothyroidism. She was put on thyroxin, thereby bringing her metabolic rate to normal.

One of the necessary things still to be done is the correlation of the symptoms and pathological findings. It appears to be a functional disturbance in that the patient can swallow liquids somewhat better than solids. The point that Dr. Vinson brought out concerning carcinoma should be considered first. The reason for the splenic enlargement is unknown, and there has not been found any change suggesting pellagra.

I think it is a very interesting condition and because of the fact that no other clinic has recognized a similar condition, it seems only fair that Dr. Vinson's name should be given to this disease.

DR. S. H. BOYER, Duluth: I have just one word to say if I may be permitted to do so. I do not believe this should be called Vinson's disease, with all due respect to the Doctor. There should be some other way of distinguishing the Doctor who doscovered the condition. The multiplicity of personal names for disease is wrong. Let us not add to this but let us distinguish the Doctor in some other manner. (Applause)

PRINCIPLES GOVERNING THE TREATMENT OF FRACTURES*

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The purpose of this paper is to discuss a few of the principles which enter into the treatment of fractures. It is a well known fact that a large percentage of the most vicious malpractice suits are based on the treatment of fractures and, as long as there is such a wide diversity of opinion as to what is the proper treatment, it behooves us to consider this subject seriously.

The surgeon who can treat a fracture with prompt, careful and painstaking attention, realizing that the first 24 to 48 hours is as important as the early management of a maternity case, will find that his patient is better satisfied and the convalescence is ofttime thus made easy. Too many times not enough attention is paid to this one point and additional trauma is added to the already torn tissues and broken bones, because the surgeon is not present to direct the treatment; or, sufficient instructions have not been given to the ambulance attendant, the nurse, or the interne at the hospital. The Thomas splint and the war has helped us greatly, but there is still room for improvement. The portable roentgen ray is the real big thing which has been introduced lately. The roentgen ray room in the hospital is of diagnostic value only in the treatment of fractures. The patient should not be carted about the hospital. After he is once in bed he should not be disturbed except for dressings.

In the treatment of fractures there are three results which we aim to make 100 per cent perfect: (1) Union. (2) Good Function. (3) Restoration of Normal Anatomy.

I. Union: The subject of *union* and *non-union* is still unsettled. Interposition of soft tissues and disease are clearly factors that produce non-union: But, with neither of these, there is still a small percentage of cases which baffles the most scientific investigation. There is a factor, however, which I think interferes with

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union, at least, to the extent of delayed union and that is absolute and perfect immobility.

In my early practice I was called to see an old lady, past 80 years of age, who ten days previously had sustained a fracture of the femur at the junction of the middle and upper third. As she was a religious fanatic, I was called for diagnosis only. With the aid of her frail daughter, she was daily assisted from the sanitary couch, on which she lay, into an old fashioned armed rocker, and back to the couch again in the evening. In spite of this treatment she obtained firm union with the leg four inches short and the foot everted to a right angle. She died three years later, of pneumonia. This case would lead us to believe that mobility did not interfere with union.

In February, 1921, Mr. A. F., farmer, aged 26, was admitted to the hospital with a transverse fracture of the femur in the middle third. I was able to get the fracture end-to-end but not perfectly reduced. He had no shortening and was perfectly comfortable with light weight extension and a Hodgen splint. After eight or ten weeks, instead of union becoming firm, as one should expect, the thigh could be very easily angulated at the point of fracture. I applied splints and, later, a plaster cast and got him up and about; in six or eight weeks he had very firm union. In this case I am inclined to think the perfect immobility at the beginning might have been a factor in the delayed union.

I feel confident from my experience, despite the fact that some very good men disagree, that a certain amount of mobility in the treatment of fractures is an aid rather than a hindrance to union.

II. Function: This should be the ultimate aim in the treatment of fractures. The surgeon's most important work is to treat the case in such a manner as will put the patient back to work, with the full use of the injured member, in the shortest possible time. Many factors have to do with good function but I only wish to speak of two: (a) Alignment without shortening, (b) Mobility of the joints.

(a) *Alignment*: It is very important that the joint surfaces should maintain the same relationship to the long axis of the bones as exists normally. Probably this can best be illustrated in fractures of the tibia. The bearing surface of the lower end of the tibia should not be tilted in such a way as to get either an eversion or an inversion of the foot. This error invariably will give a painful joint. In the matter of importance, the alignment is vastly more important than a mild degree of shortening. I do not pretend to say that alignment without shortening is always possible, but I do say the surgeon should never be satisfied until he had made this one point as nearly 100 per cent perfect as it is humanly possible.

I think Bardenhauer was one of the first to recognize the importance of thoroughly understanding the mechanics of the bones and muscles. Following out the principles laid down by him, such men as Dr. W. W. Richardson, of Los Angeles, and Dr. Joseph Blake, of New York City, with the aid of the Balkan frame and various kinds of splints, extension, and counter-extension, etc., have done some very creditable work.

My observation has been that the surgeon often fails to properly analyze the mechanics and, consequently, fails in his results. In fractures of the femur, the most common error is failure to overcome the muscle spasm. These cases require energetic and active treatment. Usually weights heavier than the text books advocate are necessary to reduce the fracture. After 40 to 60 pounds have been applied for 12 to 24 hours, in most cases the fracture can with the aid of an anesthetic and plenty of help, be reduced or, at least, the muscle spasm overcome so there is no shortening.

In all these cases the adhesive plaster should extend from the groin on the inside and from the trochanter on the outside, and it should be reinforced with diagonal strips to take in the whole leg avoiding the malleoli and possibly the knee. So far, the treatment is easy, but from now on the judgment of the surgeon must play a very important role. The patients will not stand the heavy weights for any considerable length of time. To carefully follow up the treatment and reduce the weights in such a way as to maintain a perfect reduction without untoward symptoms requires very close attention. Some of the weight will probably have

to be removed in 24 or 48 hours and, by the end of two or three weeks the weights may be reduced to ten or twenty pounds.

Dr. Kellogg Speed of Chicago, in his paper on "The Fracture of the Fermur in Children," which he presented in Minneapolis last spring, showed very conclusively what can be done with weights when carefully adjusted to suit the case.

I have at the hospital at the present time, a boy eight years old, weighing about sixty pounds. I used on him eighteen pounds to start with, which would be equivalent to about fifty pounds for a man 160 or 175 pounds in weight. I have been able to maintain the leg without shortening and was able to let the weights down to five to nine pounds in two or three weeks.

Times does not permit me to take up the various fractures but the same principle of extension is applied to all.

(b) *Mobilization* of the joints is the second factor in obtaining good function. The old idea that fracture into the joints or near the joints should be immobilized to avoid callus formation and limitation of motion seems to me to be absolutely erroneous.

The results of immobilization probably are no better illustrated than by a double Colles fracture that came under my observation a short time ago. This was a railroad man, about sixty years of age, who, in going through the yard stumbled and fell, breaking both wrists. He was treated by a doctor up country, who was very conscientious, and to be sure that he should be well taken care of, he put up the fractures on straight splints for about six weeks, without mobilization. I saw the man about eight or ten weeks after the injury, with both hands and wrists absolutely crippled so that he was unable to eat or dress himself, and suffering very great pain. Had the patient been treated by mobilization, he would at least have had very good function at the time that I saw him.

According to Dr. Joseph Blake, whose opportunity during the war to study the methods and the effect of mobilization was very great, these cases should be mobilized from the very beginning. At least once a day and, preferably, twice a day, the dressing should be removed and the joint manipulated to the limits of comfort. When a Colles fracture has been perfectly reduced and the patient is comfortable, it is a great temptation to let the mobilization go, to be taken up at some later date. However, I have been very much surprised to find, on removing the dressings, that about 50 per cent of flexion and extension can be obtained in these cases without a particle of pain. And, by persistently following them up until the patients can safely treat themselves, it is remarkable how soon we are able to get full use of the arm.

I think it was Dr. Cotton, of Boston, who has made the remark that, before the days of the roentgen ray when many of the wrist injuries which were undoubtedly fractures were treated as sprains, the disability was much shorter than at present. Rather a sad commentary on our up-to-date methods.

I had two cases which show the different results obtained by mobilization and immobilization with identical fractures of the upper end of the tibia. In both these cases there was a fracture into the joint. They were both railroad men. In both cases we decided operative treatment not necessary. One was treated some time ago by immobilization of the joint, with plaster splints, for four or five weeks. He was in the hospital from August to March and left the hospital with considerable limitation of motion. The other was treated by keeping the proper alignment and daily mobilizing the point to the limit of comfort. At the end of eight weeks he had greater motion and a better result than the other man had at the end of seven months.

I wish to emphasize that this treatment should be done without pain. Any spasm of the muscle will cause pain and the fragments of the fracture are likely to be misplaced.

III. Restoration of normal anatomy: Since the advent of the roentgen ray many surgeons have placed too much importance on the restoration of normal bony anatomy at the expense of other tissues. There has been a great wave of operative treatment for fractures, a large percentage of which is absolutely unnecessary to obtain good function. Those of us who are constantly operating feel that the technique is

sufficiently standardized at present to make the work safe and a certain percentage must necessarily be operated, but the vast majority can be better treated by the bloodless method, with quicker recovery and consequent saving of time for the patient

IN CONCLUSION

1. The surgeon must realize that each case is a problem in itself and to get the best results he must have at hand the proper splints, frames, pulleys, etc., as well as the portable roentgen ray.

2. Union is best obtained in the presence of a certain amount of mobility.

3. Alignment is only obtained by studying the mechanics and properly applying extension, counter-extension, etc.

4. Complete reduction can only be obtained by sufficient weight properly applied.

5. Mobility of the joints can be obtained from the beginning, without pain, if the fracture is handled with gentleness and light massage.

6. The treatment which shortens disability and restores function at the earliest possible date is a great economic saving, both to the patient and to society at large.

DISCUSSION

DR. J. FRANK CORBETT, Minneapolis: I thoroughly appreciate the value of the paper that has just been read, and I will tell you why I appreciate it. I have been more or less closely connected with Dr. Green for some time. I have seen the results of his treatment of fractures in and near joints, and his results have been most gratifying. I think this is because of three cardinal principles that he has observed. The first of these is mobility. Now, with reference to mobility, we should not keep a fracture perfectly still. If one studies the repair of bone the answer is perfectly clear. The repair of bone is dependent upon the blood supply inside of that bone. MacEwen has shown the nutrient arteries of a bone without repair are greatly interfered with and will not grow at all. For that reason, if we put on a Lane plate, we interfere with the blood supply. If we completely immobilize the bone, we interfere with the primary hyperemia that is necessary for endosteal repair to occur. At least, it is evident that repair occurs more rapidly where we have encouraged the blood supply by movement than when it does not so occur.

What are the other reasons for this immobilization? It is difficult to apply any set of principles to all fractures, but these will hold good. Let us suppose we have more or less injury to the muscles with any kind of fractures, and this will vary from a slight injury of a simple fracture to an extreme injury of the muscles with a compound fracture. I have seen perfect anatomical restoration of a bone with a perfectly useless limb because the muscles were bound to the bone in such a position that they could not act.

As to the prevention of joint adhesions, Dr. Green has convinced me against my will that mobility does prevent joint adhesions. I cannot explain this paradox. It does not seem reasonable, but I believe it is true, judging from the cases I have seen and handled where there were fractures into the joint as he says, they have gotten almost a perfect result in spite of the fact that he had early immobilized them.

The next important principle is the treatment of a muscle. When we have a fracture the muscle is thrown into a spasm, and a little injudicious, ineffective handling of that bone intensifies the spasm and increases it so that you can do nothing absolutely with it. I have seen a fracture where an attempt in unskilled hands and inefficient methods have been used at reduction that would get the limb in such a condition that one could do absolutely nothing with it. If you are going to overcome the muscle pull with brute force, you must use brute force; that is, if you by traction are going to overcome the contraction of the muscle a half way measure will not do. You have to use weight enough to do this, and it is perfectly surprising what simple traction will do in the reduction of fractures. Your hands cannot do that. It has to be done by some mechanical appliance in most cases, and that means sufficient weight.

DR. M. S. HENDERSON, Rochester: I agree with practically all that Dr. Green has said. However, I am not so sure that the early mobility of fractures is a good thing. There is a certain amount of mobility in any fracture no matter how thorough your attempt at immobilization. Even with a plaster of Paris cast properly applied, there is a certain amount of shrinkage under the cast and soon a certain amount of motion is permitted. I think there is a good deal of danger in the advocation of such a method of early mobility. If the instructions and methods of Dr. Green are followed closely no harm will result but unfortunatly many times such instructions are not always followed closely and bad results ensue. Our aim in the treatment of fractures is to reduce the deformity and secure anatomical alignment. If one feels he can do it best by conservative measures, that is all right, but some of us can do it better by open operations in certain types of fractures. For instance in the shaft of the femur and the shaft of the other long bones, I believe the open operation is in the majority of cases indicated. One would not think of advising an open operation on a Colles' or a Pott's fracture at least until con-

servative means had failed. An operation on a fresh fracture is not difficult. It is no more difficult to operate upon a recent fracture than to do any other major operation. Surgeons all over the state are doing operations for hernias, appendices, diseased gall bladders, ulcers of the stomach, et cetera, and the same technique carried out is sufficient for the fractures as far as asepsis is concerned. The same is probably not true of old ununited fractures, and they are a difficult group to operate upon. Handling of tissues is greater, exposure to the air is longer and infection is much more apt to ensue. While I do not advocate the open operation in all cases, I think it certainly has its place.

DR. A. J. BRADEN, Duluth: I should like to call attention to one point, and that is, in the treatment of fractures the first thing is to reduce the fracture and hold it in position. Now, I think there is something wrong about that in a way. We see practitioners reduce fractures and then try to put on some kind of splints to hold them in place. The harder it is to hold the fracture in place, the tighter they put on the apparatus which of course is all wrong. In most fractures there will be one part of it that you have control of, and the other portion you have not control of and the idea is to get the parts you can control in alignment with the parts you cannot control and without circular constriction keep them in the alignment. Mobilization is all right. If you can accomplish it, you will have good function.

DR. A. E. BENJAMIN, Minneapolis: I have been very much interested in this paper of Dr. Green's, but I would take issue with him in regard to one point, namely, the treatment of certain types of fractures by splinting. I have always been able to obtain better results in certain types of fractures by the open operation. If a man is a careful surgeon, is clean, does good work, and does not tear a hole in his glove and has his hands clean before putting the gloves on, why should he have any infection in the operation on these cases. We operate on gall-bladder cases, on appendicitis cases, and take the same chances with infection. We should not have any infection. Lane's treatment of handling bone with only instruments is wrong I believe. If you see Lane operate in his small room you can see why he gets infection because he cannot well turn around in this room without touching something not sterile. If you are in a modern operating room, and you are clean and careful, you should not have infection after operation unless you have a case that is already infected. These patients seem to get out and get to work quicker as there is not any excess of bone exudate. The functional result is better, the muscles act more normally, the circulation is more perfect, and you get a better looking limb. I would not advocate the open operation in every fracture, but only in a few cases, particularly in cases where we cannot get good alignment, or where we cannot get union without much exudate or interference with the muscle function. In certain fractures, especially in children, I have been able to obtain better results by elevating the leg and putting on extension, putting the limb in a perpendicular position. The weight of the body makes a better counter-extension. The mobilization of certain fractures as a method of treatment is all right. Our grandfather's and grandmother's method of massaging fractures and sprains was right. They got quicker results than by the later treatments of immobilization.

I have had two cases of recent fractures of the jaw, one double, and one single. I put these up for a short time, and inside of two weeks the patients were using the jaws to some extent and we got good results.

DR. C. B. LENONT, Virginia: Some of us are still advocating the open method perhaps as extensively and as frequently as we did several years ago. However, I do not believe we are doing as much open method work at the present time as formerly. The men who are doing most of the fracture work and who are familiar with it are not resorting to the open method as often as they have done in the past. I heartily agree with the writer of the paper that the better method of treating fractures is by making every effort possible to overcome the fracture by the older methods with weights or by an effort at reduction perhaps under complete anesthesia with the aid of the fluoroscope. Many times we are surprised how well these fractures are maintained after we have used deep anesthesia.

I think perhaps I was a pioneer in the treatment of fractures by the open method. For twenty years I have been treating some fractures by the open method, and I became quite an enthusiast for a time in treating fractures by the open method. I do not do it so much any more. If a fracture cannot be maintained by the ordinary method, then perhaps the open method is the best method to resort to. I would not hesitate to resort (and I have done it in the past) to the open method of treatment of fractures in children. You will find fractures of the thigh in children or fractures immediately above the knee joint that are almost impossible to maintain by the ordinary methods, and in these cases I would not hesitate to use the open method. I am proud to say that of all my fractures treated by the open method. I have never had a case of infection. I think if we are careful in our asepsis we can avoid infection entirely.

DR. C. W. MORE, Eveleth: I want to congratulate Dr. Green on presenting so practical a paper on the treatment of fractures. We have had some experience with the method of treatment he has outlined. In some instances in fractures of the thigh, an extension of forty pounds and the leg supported with sand-bags has resulted in a few days in almost perfect anatomical restoration of the parts. In other

instances this method will produce complete extension but the deformity will not be wholly corrected. For instance, in a transverse fracture the edge of one fragment may be just caught against the edge of the other, or sometimes not come quite in contact. This can frequently be overcome by proper padding, or more generally by abduction and flexion.

There is no method of treatment of fractures adapted to all cases. Where forcible extension and manipulation will not bring or hold the bones in position, an open operation is indicated. We not infrequently find muscles and fascia interposed between the broken bones, which accounts for the failure to get the proper position by the closed method.

One can hardly realize with what force the muscles pull the lower fragment of a fractured femur backwards. Several years ago, I had a case of compound fracture of the femur about five inches above the lower end. I could see through the open wound in the soft parts the bones over-lapping about two inches. The upper end of the lower fragment was pulled backward about an inch and a half or two inches. Extension was made by two assistants with proper counter-extension until the full length of the leg was obtained but the lower fragment was pulled further backward. I inserted two fingers in the wound underneath the lower fragment and, with the right hand placed upon the thigh above the upper fragment pushing downward firmly and pulling upward with my full force with the two fingers under the lower fragment, I succeeded in bringing the bones into correct position. The extension was released and the bones locked. As I slowly removed my hand and fingers from the bone, it immediately became displaced as before. It was a good ocular demonstration of the difficulty or rather impossibility of reducing this fracture wthout first tiring the muscles by extension.

In the treatment of fractures about the joint, Dr. Green and Dr. Corbett have given us a practical demonstration of the proper way to handle these cases early with gentleness and careful passive motion.

The closed treatment of fractures requires constant care and eternal vigilance. To a man who has many cases of fracture in conjunction with his other work, the closed treatment becomes irksome after some years, especially when he finds that after painstaking care he does not always get the desired results, and he is not inclined to criticize the doctor who more often resorts to the open treatment of fractures. To one who has proper hospital facilities, the open treatment presents an irresistible temptation. He must be careful with his asepsis, and at the conclusion of the operation his worry is usually over.

DR. E. K. GREEN, Minneapolis, (closing): I want to thank the gentlemen for their discussion. I think I can dismiss the question of the open method of treatment of fractures because most of you have spoken about it and I have nothing to add except that operative treatment lengthens the disability. However, I operate a certain number of fractures every year because I cannot handle them according to the principles I have laid down in my paper.

I was glad to hear Dr. Ide's paper yesterday which dealt with the different kinds of apparatus used for handling fractures. You must be acquainted with all of them, but my observation has been that many times the doctor does not properly interpret the use of the weights, extension and counter-extension, etc. In regard to mobilization, I would like to refer you to the work of Champonniere, who introduced it some years ago in Paris. Dr. W. W. Richardson, of Los Angeles has been practicing it for fifteen years with very good results. He says almost any fracture can be reduced in this manner and that it is particularly applicable to children. You can massage these cases so that the children beg to go to the doctor because they know he can make them feel comfortable.

In regard to the use of splints, we try to hold the fragments without making the splints too tight. You should have correctly fitting splints which will hold the arm in good position so that he is absolutely comfortable until he comes back the next day to have the joint mobilized. This subject is a large one, and I have only touched on a few points.

Take a joint that is easily mobilized first. Until you know how to handle these patients, either yourself, your assistant or nurse is going to give them pain. You should learn to get results without pain. You can go from one joint to another, so that in time a great many fracture cases can be treated best this way and you will be able to get the patients out in the shortest time, according to this method.

A MECHANICAL DEVICE TO FACILITATE THE HANDLING OF PATIENTS IN THE WHITMAN ABDUCTION SPLINTS

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That the comfort of patients suffering from fracture at the hip joint has been much augmented by the employment of the Whitman abduction splint is generally acknowledged; nevertheless the care of these cases, even in this most comfortable of all dressings, is fraught with difficulties, which outside the well equipped hospital, at any rate, are well nigh insurmountable.

The maintenance of proper cleanliness of bed and body, the employment of the bed pan, the prevention of bed sores, the securing of that bodily rest and comfort which frequent change of position only can give, and the bolstering up of the patient's morale sufficiently to enable these usually aged and feeble persons to endure a long period of rigid confinement, are tasks which try to the uttermost the skill and patience of physician and nurse alike.

The conviction that these problems are in a great measure solved by the use of the mechanism employed by us and illustrated here, constitutes our excuse for offering this contribution to the already voluminous literature covering the subject of treatment of this desperate condition.

The device has been thoroughly tried out and has in all cases in which the Whitman treatment could reasonably be employed, contributed greatly to the comfort of the patient while lessening the work of the nurse Light patients are of course, more easily handled than the very heavy ones but by simply increasing the size or number of pulleys employed the heaviest patient can be moved about as desired.

The essential feature of the mechanism is the belt shown in Figure 1. This is simply a strip of canvas 6 inches wide and 60 inches long with a stout iron ring securely attached to either end. This belt is brought into service by means of an ordinary block and tackle arrangement attached to an overhead rail which is supported by a balkan frame.

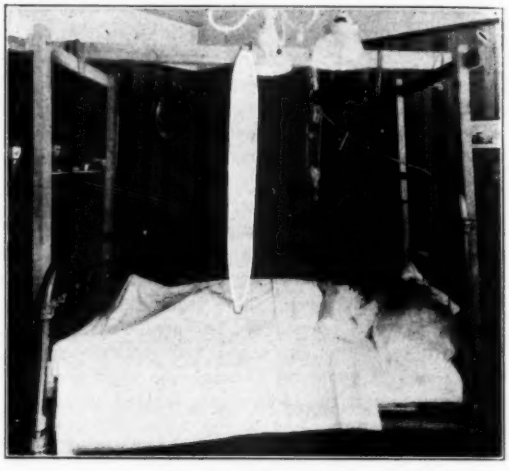

Fig. 1

If it is desired to change the bed linen or use the bed pan, the belt is slipped under the patient at the level of the iliac crests, the rings thrown over the hook attached to the lower block, the patient raised clear of the sheet, and the pulleys locked in position. The patient meantime steadies herself by grasping the strap attached to the overhead rail as shown in Figure 2. The necessary manoeuvres are made deliberately, unattended by suffering on the part of the patient or undue trouble for the nurse.

In turning the patient over in bed for the purpose of caring for the skin of the back and giving rest, the nurse proceeds as follows (Figs. 3, 4 and 5): Standing at the uninjured side of the patient with the belt so placed that its middle is under the midline of the back at the level of the iliac crests, the nurse raises her clear of the sheet and pushes her gently to the far side of the bed and there lowers her. The rings are removed from the hook and the belt drawn through under the patient until one ring rests against the cast just behind the anterior superior iliac spine on the side of the injury. The rings are replaced on the hook and the slack in the belt on the uninjured side is taken up by pressing it down upon the cast over the abdomen, holding it there rather snugly while traction is made on the rope. As the body

Fig. 2

rises from the bed the slack in the belt is gradually fed out and the patient automatically rolls toward the nurse. When she has been rolled a little more than half way over she is slowly lowered, the nurse meanwhile rotating her body by grasping the cast at the level of the knee and drawing it toward her so that when the patient has come to a prone position the toes on the injured side just clear the edge of the mattress. The patient is given a pillow and is now in a comfortable position in which to lie while the back is being cared for. Pads of absorbent cotton wrapped in gauze, which have been packed between the body and the cast to protect the bony points are removed; the skin, as far as it can be reached is bathed with alcohol and massaged and the pads replaced. The part of the cast distal to the knee joint having been bivalved (Fig. 6) the posterior portion is removed and the ankle and knee joints flexed and extended and the calf muscles massaged. This arrangement makes possible the prevention of stiffness of the joints mentioned and is a very necessary provision. The removable part of the cast is then replaced and held with tape straps, the patient's hair dressed, and such other matters attended to as may contribute to her comfort.

She is now ready to be turned onto her back. This is done by readjusting the belt so that the ring on the injured side lies over the anterior superior spine of the ilium and then repeating the process of turning as described above. If the patient has been worked too far downward in bed in turning her over it is only necessary to move the tackle toward the head of the bed a few inches as shown in Figure 7, when on raising her slightly she will automatically float up into the desired position. If she is found to be too far toward the head of the bed the process is reversed. Other useful purposes such as will suggest themselves to the physician during the treatment of the case are readily served by this cheap and simple device.

Fig. 3

During the first few days, or until the patient has been convinced of the safety of the procedure it is advisable for the physician to supervise the manoeuvres but after the first week the nurse alone or with such assistance as may be found in any home can easily carry them out. It will be noticed that in the case here illustrated the position of abduction was not employed because it was deemed unwise in this particular instance to break up the impaction. Abduction of the limb however in no way interferes with the use of this mechanism.

That the end results of treatment of fracture of the hip have shown much improvement since the Whitman method has come into more general use is, we think, undeniable. Just how much of this improvement is the result of more

Fig. 4

Fig. 5

Fig. 6

Fig. 7

accurate adjustment and better fixation of the fragments and what part is to be credited to the encouragement of constructive metabolic processes by the promotion of bodily comfort and the avoidance of infection (hypostatic pneumonia, septic bed sores, etc.) is a nice question and one not easily answered; but that the latter factor is a large one would seem to admit of no question. In our experience the employment of the above described device has made possible the maintenance of an excellent state of general health in these patients throughout their necessarily prolonged period of confinement and we believe that the good effects of this condition of general well-being have been reflected in the end results obtained.

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Vol. V February, 1922 No. 2

EDITORIAL

REPORT OF THE COMMITTEE ON MEDICAL PROGRESS OF THE SOUTHERN MINNESOTA MEDICAL ASSOCIATION

One year ago the committee on Medical Progress was appointed at the suggestion of the executive committee of the association. The object of this appointment was to determine the advisability of having a committee of this character to assist the membership of the association directly in medical matters and to promote more careful record taking and investigation of the early manifestations of disease as observed by physicians in general practice. Your committee has reached the conclusion that a permanent committee of this type would be an asset to the association

(1). It could act as a means by which anyone in the association could be put in touch with those especially qualified to assist them in special problems or with technical information.

(2). It could probably place at the disposal of the members, through the libraries of the State institutions, the important bibliography on any subject to be specially investigated.

(3). It could obtain and crystalize the sentiment of the association concerning any problems of general medical interest or of special importance to the general public.

(4). It could acquaint the members of the association with information concerning epidemics.

(5). And transmit to the members important information concerning the use of drugs and the treatment of disease.

(6). Encourage investigation and the publication of papers by physicians in general practice on topics which they are best qualified to discuss.

(7). Obtain and collect from members of the association data on the early symptomatology of disease.

There would doubtless be other ways in which this committee could be of assistance to members of the association. Whether its work would be valuable or not would depend largely on the freedom with which it would be made use of by the individual members.

As a concrete suggestion at this time it is proposed that some member of the society, preferably one in general practice, be appointed to report at the summer meeting of 1922 a collaborative study on "The Early Symptomatology of Poliomyelitis," the information for this report to be obtained from as large a percentage as possible of the membership of the association.

Walter H. Valentine, M. D.
S. Marx White, M. D.
H. Z. Griffin, M. D.
Nov. 30, 1921. Chairman.

PROFESSOR ADOLPH LORENZ

The occasion of Professor Lorenz's second visit to America has been the source of much newspaper sensationalism and 'twere well to make known the truth of the situation as accurately as can be learned. It must be confessed that the newspaper interpretation of the situation made every right thinking physician blush for his profession. What are the facts?

Some years back Dr. Lorenz, who had gained a world-wide reputation through his development of a technic for the reduction of con-

genital dislocation of the hip by means of manipulation and fixation, added to his notoriety when he came all the way from Vienna to Chicago to perform the much heralded "bloodless operation" on a Chicago heiress. The fee, in itself a fortune, was made public and gave the newspapers material for sensational headlines.

In the prewar days many American physicians made a point of visiting Dr. Lorenz's clinic in Vienna and there saw a venerable and amiable university professor at work. As a result of the depreciation of the krone, wealth in Austria has ceased to exist. Those who were once well-to-do, today have nothing, expressed in terms of their national medium of exchange, and even less, expressed in American dollars. There is no doubt but that Dr. Lorenz has suffered financially in exactly the same way as all the other well-to-do Austrians. To make a trip to this country and visit in New York requires cash, and we know that Dr. Lorenz intended and expressed his intention of collecting and actually did collect fees from private patients in New York, although the newspapers failed to give prominence to these facts. What was heralded in the news columns was that Lorenz was making a trip to this country to treat the needy in expression of Austria's gratitude to America for what has been done for Austria since the war.

Now it seems self evident that fees were quite necessary to make this trip possible. We can excuse Dr. Lorenz for assuming that there would be no criticism of his doing private practice in America inasmuch as no public objection had been raised on his previous visit. And we cannot blame the venerable visitor for all the publicity associated with his visit. The American surgeons in whose hands Dr. Lorenz has placed himself have certainly been indiscrete in charging large fees for his consultations.

Publicity is worth dollars and cents in professional just as in mercantile activities. Advertising is strictly unethical according to present day medical standards. How easy it was, then, for the New York group to take advantage of the free advertising given this visiting surgeon. Cripples flocked to see the widely heralded visitor, services were not all furnished gratis as advertised, and many hopeless cripples were bitterly disappointed. We do not wish to criticise our visitor, but we do severely censure our own countrymen who took advantage of the situation for their own gain.

Lorenz's visit may have been quixotic in the sense that American children are more in need of his services than the Austrian children. Then, too, the original Lorenz operation has been much modified and improved in the past eighteen years, both in Europe and America.

In answer to the criticism that the surgeons of this country would allow professional jealousy to deprive the cripples of this country of superior professional treatment, we would point to the recent visit of Colonel Smith, who toured the country demonstrating his cataract operation gratis without a ripple of criticism as to the ethics of the visitor.

MINNEAPOLIS OFFICE

Minnesota Medicine takes pleasure in announcing that it has leased quarters at 210 Commercial Building, Third Street and First Avenue, North. The Minneapolis office has been opened to more adequately serve the physician of Minneapolis and a growing clientele of advertisers in the Minneapolis district. The telephone number is Atlantic 2716.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

The Minnesota Pathological Society of the University of Minnesota held a very interesting meeting on the evening of January 13, 1921, at which a paper by Dr. J. C. Bloodgood, of Baltimore, was read, entitled "Tumors of the Breast."

A branch of the Society of Experimental Biology and Medicine (New York) has been formed at the University of Minnesota and holds its meetings every alternate month. Except the branch on the Pacific Coast, this is the only other branch of this Society outside of New York.

The first meeting was held on October 12, 1921. The following officers were elected: A. D. Hirschfelder, executive secretary; F. H. Scott, L. S. Palmer, E. J. Lund, E. C. Kendall, council.

The second regular meeting was held at the Minnesota Union on Wednesday, December 14, 1921, and was preceded by an informal dinner. The following papers were presented and will appear in the regular proceedings of the society which are edited in New York:

(1) A. T. Henrici: A Statistical Study of the Form and Growth of a Spore-bearing Bacillus.

(2) R. E. Scammon: A Comparison of Bodily Growth of Faetuses, Premature Infants and Normal Children in the First Year.

(3) E. D. Brown: An Undetermined Principle Obtained from Poison Ivy.

(4) L. S. Palmer: The Effect of Heat on the Calcium Salts and Rennet Coagulability of Cow's Milk.

(5) George Fahr: The Velocity of Development of the Demarcation Current in Muscle.

(6) A. D. Hirschfelder and H. H. Jensen (by invitation): The Pharmacological Action of some Ethers and Esters of Saligenin.

OF GENERAL INTEREST

Dr. Alberta Green, of the state hospital staff, St. Peter, spent the holidays in New York.

Dr. G. E. Sutton, of Rochester, has moved to Texas, where he will engage in the practice of medicine.

Dr. G. D. Mahon, of Rochester, and family have moved to Texas where they will reside in the future.

Drs. E. R. Bray and J. L. Shellman announce the removal of their offices to 342 Lowry Building, St. Paul.

Dr. H. M. McIntire, of Waseca, has been in Chicago recently where he took a two weeks medical short course.

Dr. Courtice Eshelby, of St. Paul, announces the opening of a Clinical Diagnostic Laboratory at 412 Lowry Building.

Dr. Lewis Gregory Cole, prominent roentgenologist of New York City, recently delivered a lecture at the Mayo Clinic.

Dr. Carman was elected president of the Radiological Society of North America at the recent meeting in Chicago.

Dr. L. W. Satterlee, who has been practicing in Alexandria for the past sixteen years, has recently located at Parkers Prairie.

Dr. Charles H. Gordon, late with the Sluder Clinic, St. Louis, has become associated with Dr. W. W. Lewis, 836 Lowry Building, St. Paul.

Dr. A. H. Brown, of Pipestone, recently returned from Chicago, where he has been taking a special course in surgery at the Presbyterian Hospital.

Dr. H. W. Froehlich, of Thief River Falls, attended the annual convention of the Western Association of Surgeons held at St. Louis during December.

Dr. B. C. Bernard, formerly connected with the Sand Beach Sanitorium at Lake Park, has accepted a position with the county sanatorium at Wabasha.

There is a good opening for a doctor at Underwood, Minnesota. This is a good town with large contributing territory, and nothing to buy. For further information address Independent, Underwood, Minnesota.

The West Central Minnesota Medical Society recently held its annual meeting at which Dr. C. R. Christenson was elected president; Dr. Amos Leuty, secretary.

Dr. J. M. Fisher, of Virginia, Minnesota, has recently located in St. Peter, where he has secured the offices formerly occupied by the late Dr George E. Merritt.

Dr. W. E. H. Morse was elected president of the Rice County Medical Society at its recent annual meeting, and Dr. C. M. Robilliard was re-elected secretary-treasurer.

The Kandiyohi-Swift County Medical Society recently held its annual meeting at which Dr. P. C. Davison of Willmar was elected president, and Dr. John C. Jacobs secretary.

Dr. O. F. Mellby, of the Thief River Falls Clinic, announces that he has given up general practice and will in future engage only in treatment of diseases of the eye, ear, nose and throat.

Dr. Palmer L. Bowdish, who has been engaged in work for the Massachusetts State Board of Health for several years, has accepted the office of superintendent of the Sand Beach Sanatorium, at Lake Park.

Dr. and Mrs. J. J. Gelz, of Richmond, Minnesota, sailed recently for Italy where Dr. Gelz will study for a year or more. Dr. Pfaff will be in charge of the hospital at Richmond during the absence of Dr. Gelz.

Dr. O. N. Meland, of the Warren Clinic, has just become a Fellow of the College of Physicians and Surgeons of America. Dr. Meland is on the staff of the Kittson County War Veterans Memorial Hospital.

Dr. Campbell P. Howard, Professor of Medicine at the University of Iowa, gave a Mayo Foundation Lecture, December 30, in the Assembly Room; his title was, "Personal Reminiscences of Sir William Osler."

At the recent annual meeting of the Waseca County Medical Society the following officers were elected for the ensuing year: President, Dr. J. F. Lynn; vice president, Dr. H. Hagen, secretary, Dr. H. A. Miller.

The Mower County Medical Society recently held its annual meeting at Austin, at which time the following officers were elected: President, Dr. E. H. Morris; secretary, Dr. P. A. Lommen; treasurer, Dr. A. E. Henslin.

Dr. J. C. Litzenberg, Professor of obstetrics at the University of Minnesota, gave a Mayo Foundation Lecture, December 16, in the Assembly Room; his title was, "Some milestones in the history of obstetrics and gynecology.

The annual meeting of the Red River Valley Med-

ical Society was held during December, at which the following officers were elected: President, Dr. H. M. Blegen, Warren; vice president, Dr. O. E. Locken; secretary-treasurer, Dr. Lyle Brown.

At the recent annual meeting of the Nicollet-LeSueur County Medical Society the following officers were elected for the ensuing year: Dr. H. B. Aitkins, president; Dr. J. W. Daniels, vice president; Dr. J. E. LeClerc, secretary; Dr. D. MacDougald, treasurer.

Drs. Samuel Lemberg, Edward C. Kendall, L. G. Round tree, Norman Keith, Walter Boothby, Henry Holmholz, Frank C. Mann and E. C. Rosenow, the Mayo Clinic, Rochester, attended the medical meeting at New Haven, Conn., in December, where they read papers before the American Physiological Society.

It was erroneously stated in a recent issue of Minnesota Medicine that Dr. W. J. Mayo was a member of the committee which went to China to attend the opening of a large hospital established by the Rockefeller Foundation. Dr. Mayo was invited to be present at the ceremonies but was unable to accept the invitation.

The Medical Forum, of St. Paul, was organized in December 1920 for the purpose of promoting interest and discussion in the field of the medical sciences. The membership is limited to fourteen, being composed of members of the Ramsey County Medical Society, or those eligible to it. The meetings of the Medical Forum are held each month at which papers are presented, the discussion following being entered into by every member present.

NEWS OF THE HOSPITALS

Dr. A. H. Kaplan, pathologist at St. John's Hospital, St. Paul, has been promoted from lieutenant to captain in the Medical Corps of the Minnesota National Guard.

Five additional nurses have recently entered the training school of St. John's Hospital, St. Paul.

The West Side Hospital, St. Paul, held its commencement exercises on the evening of January 10th, at which five nurses received their diplomas.

Drs. Leo. Hilger and A. H. Kaplan, of the staff of St. John's Hospital, St. Paul, recently read papers before the Barron, Wisconsin, Medical Society.

CORRECTION

In the January issue of Minnesota Medicine, in the list of physicians licensed at the October 1921 examinations, names of three licensees were incorrectly spelled. The name of Rudolph Geo. Andreas should read Rudolph Geo. Andres; Evelina Wilhelmina Ehramann should read Evelina Wilhelmina Ehrmann, and Carl Aaron Hwer should read Carl Aaron Hyer.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of December 14, 1921

Dr. H. L. Staples presiding.

Dr. A. E. Benjamin reported the following case:

E. T., age 40, male, married, Canadian, traveling man, heavy smoker. **Diagnosis:** mediastinal fibroma; multiple adenomata of thyroid. Family history negative. Personal history of Bright's disease and dropsy 21 years ago; in bed 28 months. Operation 2 years ago for pleurisy, no fluid found, severe hemorrhage and nearly bled to death. Was told liver was on wrong side and had been cut into. Noticed heart beat on right side and x-ray showed stomach on right side also. Neck began to enlarge 2 years ago following operation. At that time began to have spells, coming on in morning while still in bed, convulsive movements, occasionally unconscious, ending in noisy sleep. Duration 30 minutes to 6 hours. Interval 2 days to 1 month. Less frequent but more severe of late. No prodromata. Followed by increased dyspnea and gas on stomach and more recently by marked weakness.

Examination: Tonsils somewhat reddened. Adenoma of thyroid, larger on right. Superficial veins very large, especially of neck and upper thorax. Heart on right side apparently normal. Right chest apparently normal. Left chest; no breath sounds except at apex and parasternal and paravertebral near base of left chest. Dulness constant over remainder. Abdomen: increased tympany. External hemorrhoids. Extremities: very marked transitory edema of ankles and legs.

Laboratory: Hb. 80 per cent. P. S. P. 77 per cent. Blood pressure 134/90 to 120/80. Basal metabolism plus 16. Wassermann negative. Urine: (9/17/21) alk., 1011, albumin ++; sugar 0; pus, few; R. B. C. 50 per H. P. On 11/16/21 it showed alk., 1014, albumin 0, sugar 0, pus occasional, R. B. C. few.

Patient admitted to hospital in comatose condition which had been present the past 18 hours. Breathing stertorous and labored. Breathing with less effort when lying on left side. Admitted to hospital November 21 and died six hours later.

Pathologist's report (Dr. B. J. Clawson): The body is that of a well-developed poorly-nourished man, 166 cm. in length; estimated weight 125 pounds. Rigor mortis is present. There is hypostasis posteriorly. No edema. Cyanosis present on face. No jaundice. Pupils are equal and regular. Veins of neck are markedly dilated on both sides. There is an old healed scar about 15 cm. long in the 5th interspace in the anterior axillary line. There is a pigmented area over the left scapula. The right pleural cavity is free from fluid and adhesions. The left cavity is completely obliterated by a white, hard,

nodular mass which extends about 5 cm. to the right in the midsternal line. This mass is adherent by dense fibrous adhesions to the parietal pleura and to the old operative wound. It is also firmly attached to the posterior mediastinal tissues. Heart weighs 350 grams. Lies in right pleural cavity. The wall of the right ventricle is thickened. Valves seem normal. The muscle is firm and of a dark red color. The root of the aorta shows no sclerosis. The left lung weighs 300 grams and shows no crepitation throughout. It is pushed into the apex of the cavity. The right lung weighs 670 grams. It is dark in color and on section frothy bloody fluid exudes on pressure. Each kidney weighs 200 grams. They are dark in color. The capsules strip readily leaving smooth surfaces. The cortical markings are well preserved. The thyroid is markedly enlarged, weighing 250 grams. The enlargement is in both lobes, shows many nodules and on section small cysts containing colloid and blood are found.

The tumor mass weighs 12.5 pounds and completely fills the left pleural cavity except a small space at the apex. It is firmly attached to the diaphragm, to the old operative wound, and to the posterior mediastinal tissues. It is hard, roughened and well circumscribed. It measures 27 cm. vertically, 22 cm. transversely, and 12 cm. anteroposteriorly.

Miscroscopic examination: The tumor is a fibroma, showing extensive hyalinization.

Diagnosis: 1. Mediastinal fibroma. 2. Multiple hemorrhagic adenomata of thyroid with colloid degeneration. 3. Right bronchopneumonia.

Discussion by **Dr. A. Schwyzer**: Fibromas of the mediastinum are very rare. There had been only 5 or 6 reported at the time last year when I reported a case of fibroma. Observed case for 4 months. Patient did not want operation because pain was not sufficient. Later when pain increased the operation was done. We inflated the lungs and had to split the manubrium to get it out. That operation was done 2 years ago. We fluoroscoped him a while ago and the lung field was entirely clear.

Dr. H. L. Ulrich reported two heart cases.

Case 1. Mr. S., age 53. Farm and dealer in real estate. Complaint: heart trouble. F. H.: cardiac.

Personal history: Always a weakling physically; had pneumonia as a child. Denies venereal disease. Has had several attacks of tonsilitis. Has had a maxillary sinus washed out. No previous cardiac history of dyspnea, palpitation. No pain. No cough.

Present Illness: Last three years feeling pepless and easily tired out. In May 1921 had an attack of dizziness. Consulted physician and was told he had a weak heart muscle. In June he had another attack of dizziness on exertion. Had subsequent attacks and determined to lie down. In July he consulted another physician and told to go to bed. In bed 2 weeks when chiropractor took charge, who made matters worse. In September consulted another physician who put him to bed for a month. He was then seen by Dr. Head, who advised another month flat on his back. He consulted us the latter part of October. At that time his physical examination elicited the following facts:

Spare man, with no physical findings except mild pyorrhea, chronic amygdalitis, questionable cholecystitis, and a heart extremely irregular, rapid, not increased in size. No thrills or shock. A soft systolic bruit at the apex following a snappy 1st sound, along left of sternum a diastolic bruit is heard, and at the base a to-and-fro murmur is made out. Blood pressure when first seen varied systolic up to 160, diastolic 80, and sounds at the cuff varied in intensity. All came through at 120. His blood picture, urine and Wassermann are normal. Lack of enlargement of heart and its rapid irregularity made us suspect auricular flutter or possibly nodal rhythm. The electrocardiograph disclosed the condition.

Electrocardiogram taken on 10/29/21 showed auricular flutter, auricular rate 230 and ventricular 110. Also a right-sided preponderance. The degree of functional block varied, giving a complete irregularity, but the majority of complexes showed a 2 : 1 block. The vital capacity of the lungs when first seen was 3100 cc. An electrocardiogram taken 2 days later on admittance to the hospital again showed flutter with auricular rate 230 and ventricular 80. More of the complexes showing higher grades of block. He received 12 cc. of Tr. Digitalis, University of Minnesota leaf, standardized 65 mg. to cat unit, in 24 hours. He left the hospital 11/3/21 with pulse still irregular but slow. On 11/8/21 electrocardiogram showed completely different form. Ventricular rate varied between 40 - 50. The majority of complexes showed no definite auricular wave, with rhythm probably arising in the auriculo-ventricular node. There were occasional series of 3 or 4 complexes with well-developed P-waves and varying P - R intervals. On 11/15/21 practically all complexes showed a single P-wave for each ventricular complex with varying P - R intervals. Occasionally the P-wave was absent. Tracings taken weekly during the following 3 weeks showed a normal cardiogram except for right-sided preponderance, slightly widened Q-R-S, and marked sinus arrhythmia. His vital capacity rose to 3800 cc.

Case 2. (Dr. Nathanson's case.) Dr. O. A., age 24, dentist. Complaint of palpitation, depressed feeling. F. H. negative except sister died of diabetes.

Personal History: Always good. Mixed in athletics without difficulty. No illness except occasional attacks of tonsilitis. Tonsillectomy 5 years ago. Small tag of tonsil tissue left. Habits O. K. except excessive cigarette smoker.

Present Illness: Two days before seen was in gymnasium partaking of strenuous game of hand ball. Suddenly became dizzy and felt faint. Had to lower his head between his knees or would have fainted.

Felt cold and looked white. Cold sweat broke out. Felt weak and faint for about one-half hour. At this time became conscious of his heart beat and it felt irregular. Has been feeling depressed since and easily tired out.

Physical examination: Essentially negative. Heart not enlarged, completely irregular, first sound at apex somewhat snappy, P_2 accentuated.. Blood pressure 130/90. V. C. 4400, normal. Laboratory examination negative.

Electrocardiogram taken when first seen on 11/11/21 showed auricular fibrillation rate 70 - 80 and slight right ventricular preponderance. As he showed no evidence of cardiac insufficiency he received no digitalis and was merely advised to restrict his activities, as his fibrillation was considered a transitory one resulting from his acute cardiac overstrain. The fibrillation persisted, however, and on 12/5/21 he was put on quinidine sulphate gr. v. three times a day. After his 4th dose the palpation and precordial discomfort disappeared. When seen his pulse was slow and regular. Electrocardiogram taken on 12/7/21 showed normal rhythm with rate of 60.

Dr. Chester O. Tanner presented the following case for **Dr. Franklin R. Wright.**

Case of melanoma with no signs of recurrence 9.5 years after operation.

Case No. 20-463. H. P., 41 years of age, male, was admitted to the hospital May 16, 1912 because of a purplish colored tumor growth on inner aspect of right leg. He gave the following history:

Ever since boyhood he could remember a small raised pigmented mole on right leg. In his work as a mail carrier he rode a bicycle and the mole rubbed against the bicycle frame. About a year previous to admission the mole suddenly began to grow, increased rapidly in size and bled easily. Examination on admission to the hospital showed an elevated purplish colored tumor mass the size of a hickory nut on inner aspect of right leg. No metastases or glandular involvement was found.

Operation: May 17, 1912. Tumor with adjacent oval-shaped area of skin and subcutaneous fat 8 cm. x 5 cm. in size was removed.

Gross specimen is a purplish colored, roughened, tumor mass, 3.5 cm. in diameter, elevated 1 cm. above the skin surface, together with an ovoid area of skin 8 cm. x 5 cm. in size. Running out from the base of the tumor for a distance of about 1.5 cm. is an irregular indurated skin area. Microscopic sections through the main portion of tumor show a slightly thickened squamous epithelial surface beneath which are large mases of epithelioid-like cells separated by dense connective tissue septa. These cells are polygonal or fusiform in shape, with thiny processes. These processes in many of the cells contain brownish yellow pigment granules. Within the connective tissue cells of the septa and also in the interspaces are seen deposits of this pigment.

Diagnosis: Malignant Melanoma.

Subsequent History: June 1921, patient is still living and well with no signs of recurrence more than 9 years after operation.

In reviewing the literature upon the rapidity of growth and mortality of malignant melanomata in general, we find an early death in most instances and few cases where a recurrence was prevented for a long period of time. Bloodgood has careful personal notes of 65 cases of malignant pigmented moles. These cases were collected from various sources. In every instance the diagnosis was confirmed by a pathologic examination. Up to the present time there is not a definitely cured case among them. Just collected 57 cases which lived on an average of 3 years from the time of the first observation of the tumor until death. Henocque reported a case of melanoma of the axillary gland which existed 9 years up until the time of the patient's death from pyemia. Later Schilling described a similar tumor which developed on the inner side of the left knee, and, growing slowly since puberty, existed 20 years up until the time of death from numerous metastases. Eves analyzed the records of melanomata in the London Hospital during a period of 25 years and found 45 cases, of which 33 occurred in the skin. Out of this number 26 began in pigmented moles. The average duration of life in his series was between 2 and 3 years and one prolonged as long as 11 years. In still another case—a melanoma of the dorsum of the hand—involvement of the lymphatics of the arm and axilla was delayed for 20 years.

Wilson and Kolteyer collected 13 cases but were unable to determine the exact length of duration of disease in all of them. The shortest course was measured by weeks, while in the longest, death occurred after a period of 10 years; the average duration slightly exceeded 3 years. Keen reported 3 cases, one of which showed no signs of recurrence 7 years after operation.

Broders and MacCarty were able to follow 38 patients with melanoma and found that 86 per cent (33 patients) died as follows:

Within 1 year after operation	24
" 2 " " "	4
" 4 " " "	1
" 8 " " "	3
Dead, date unknown	1

The other five patients were followed and found to be living as follows:

1 year after last operation	2 patients
2 " " " "	1 "
3 " " " "	2 "

The average duration of life in this series after the last operation was 11 months and 3 days. (This includes a melanoma of the choroid which lived 8 years after operation.)

This paper does not include melanoma of the choroid, which condition seems to be quite different from that of the skin melanoma.

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Dr. W. F. Braasch, Rochester, Minn. presented 3 cases of duplication of the renal pelvis (Double Kidney).

Case 1 (A376487), Miss M. J., aged 32 years, came to the Clinic because of attacks of dull pain referred to the left upper abdominal quadrant and radiating to the lower quadrant; she had had attacks for 4 years, a severe one 1.5 years before. Recently the attacks had occurred every 8 to 10 days, or they lasted from 12 to 24 hours and were followed by a dull ache in the anterior part of the abdomen, often with flatulence and distress over the entire lower abdomen. Frequency was moderate. It will be noted that the pain was entirely anterior and not at all suggestive of renal involvement.

The systolic blood pressure was 98, the diastolic 66. The urinalysis was practically negative. The phenolsulphonephthalein return was 50 per cent in 2 hours and 15 minutes. Roentgenograms of the urinary tract, colon, and stomach were negative. A cystoscopic examination was made for the purpose of identifying the pain.

Both ureteral orifices were normal in location and appearance, the secretion of the right kidney was normal. A catheter introduced into the left ureter did not meet obstruction. 110 cubic centimeters of residual urine was withdrawn from the renal pelvis; there was only a faint trace of phenolsulphonephthalein in 15 minutes. A pyelogram of the left kidney showed definite dilatation of pelvis and calyces. The dilatation, however, did not appear sufficiently marked to account for the large amount of residual urine found in the renal pelvis, which we were at a loss to explain. A diagnosis of left hydronephrosis was evident. (Fig. 1.)

At operation the renal pelvis was found to be markedly dilated. The kidney tissue was evidently largely destroyed, and a nephrectomy was performed. On section of the kidney two definite segments of the renal pelvis was found, the upper of which was confined within the kidney proper; the dilated portion visible outside the kidney was directly related to the lower segment only. The two segments of the

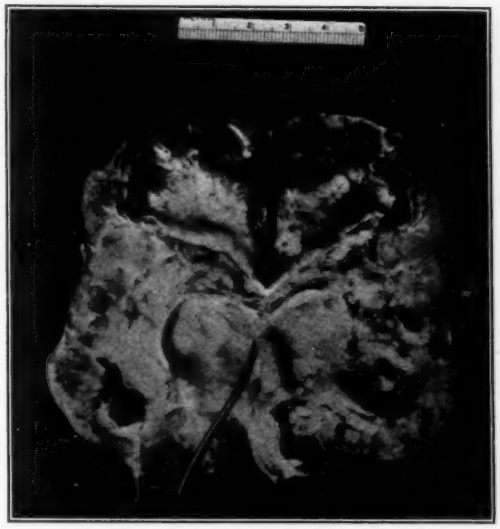

Fig. 1 (376487). Section of kidney showing duplication of renal pelvis with hydronephrosis of both. The two pelves are connected by adjacent calices and have but one ureter.

pelvis were separated by a definite band of atrophied renal tissue and were connected by a narrow isthmus which corresponded to two adjacent calyces which had coalesced. The calyces were markedly dilated in both pelves. Only a narrow rim of cortical tissue remained which appeared to be atrophic.

Case 2 (A342668), Mrs. B. M., aged 30 years, came to the Clinic presenting symptoms of urinary frequency which had begun 11 years before and had

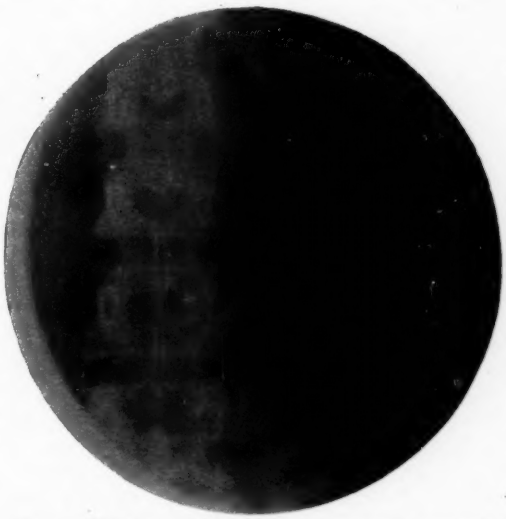

Fig. 2 (342668). Outline of the upper abbreviated pelvis in the double kidney as is usually observed. The lower pelvis is obliterated.

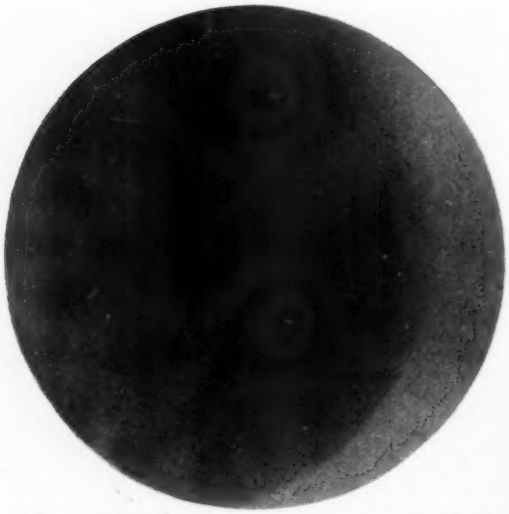

Fig. 3 (377195). Outline of the upper pelvis in the double kidney; the lower pelvis and its ureter obliterated. The point of juncture of the two ureters is shown where the ureter becomes dilated.

persisted at intervals since, and pain referred to the neck of the bladder. For 2 years the patient had had occasional dull pain referred to the left kidney area, but this had improved during the past year. Formerly she had occasional spells of epigastric distress. The general condition was suggestive of neurosis. There was no loss in weight. (Fig. 2.)

General physical examination, including roentgenograms of the urinary tract and chest, was negative. The systolic blood pressure was 100, the diastolic 55. A specimen of urine catheterized from the bladder showed but 20 pus cells to a high-power field of the miscroscope. The sediment was stained for the bacilli of tuberculosis and was negative. The phenolsulphonephthalein return was 50 per cent in 2 hours and 15 minutes. Systoscopic examination revealed a bladder with normal capacity, and, save for a few areas of slight inflammation, comparatively normal. The left ureteral opening was slightly eroded, with an inflamed area of mucosa and granulation tissue around it. Obstruction was met by the catheter introduced into the left ureter at a distance of 2 cm. from the opening, but at a subsequent examination the catheter passed into the ureter to a normal length without obstruction. Catheterized specimens obtained at the second examination from both right and left kidneys were normal. A pyelogram made of the left side showed a very small pelvis with abbreviated calyces. The ureter was but slightly dilated for a distance of several centimeters. Below this it was markedly dilated. A diagnosis was made of duplication of the pelvis and ureter with destruction of the lower pelvis (?), atrophic pyelonephritis (?), and tuberculosis of the left kidney (?).

At operation a double kidney with duplication of the pelvis and ureter was apparent. The lower pole of the kidney was atrophic and cicatricial. The two parts of the kidney seemed quite distinct, with a definite zone of demarcation. It was thought at first that the lower portion was atrophic as the result of cicatricial pyelonephritis, since no definite evidence of tuberculosis had so far been discovered. The lower portion was then resected without much difficulty. On microscopic section of the renal tissue at the line of excision areas were found containing a typical tubercles and giant cells. The remaining portion of the kidney was then removed even though no definite evidence of tuberculosis was found in the tissues removed from the line of excision.

Fig. 4 (377195). Exterior of the double kidney. The lower pole is atrophied and diseased; upper pole apparently is normal.

Case 3. (A377195), Mr. G. V. G., aged 35 years, came to the Clinic with symptoms beginning 15 years before with slight urinary frequency at irregular intervals. Seven years before he had had a period of dysuria with increased frequency and very cloudy urine which had continued over a period of several months. Since then he had had a diminished urinary disturbance with soreness and dull ache in the urethra. Five years before he had noticed hard painless nodules in the left epididymis, and two years before, the same condition in the right epididymis. One year before, he had had slight hematuria. (Fig. 3).

The general examination was negative save for

moderate chronic bilateral tuberculous epididymitis. The left lobe of the prostate was nodular. Roentgenograms of the urinary tract and chest were negative. A moderate amount of pus was found in the urine, and after repeated stains, acid-fast bacilli were found. The phenolsulphonephthalein return was 50 per cent in 2 hours. Cystoscopic examination revealed a slight cystitis. The urine from both ureters appeared to be normal. A catheterized specimen of urine from the right kidney was normal; that from the left kidney contained an occasional pus cell. The differential phenolsulphonephthalein test showed 20 per cent to be coming from the left kidney and 7 per cent from the right in 15 minutes. A pyelogram of the left side showed marked dilatation of the ureter; the pelvis and calyces were abnormally small. A diagnosis was made of tuberculosis of the left kidney. (Fig. 4).

At operation a double kidney with tuberculosis in the lower segment was found. The upper portion of the kidney appeared to be normal, while the lower segment was very evidently diseased and functionless. Since the bacilli of tuberculosis had been found in the urine, a complete nephrectomy was performed. On section of the kidney a sharp line of demarcation between the healthy and diseased portions was noted. On microscopic examination of the apparently normal tissue, however, several areas of encroaching foci of tuberculosis were observed. (Fig. 5).

Discussion by **Dr. A. Schwyzer.** We have to thank Dr. Braasch for bringing these interesting cases before the Academy. The marked infection of one portion of the kidney with practically complete freedom of the remainder of the kidney is very interesting.

Fig. 5 (377195). The kidney sectioned showing the atrophied lower segment with dilated calices and apparently normal upper segment.

In this connection I may mention a case where we found the upper pole of the right kidney in a young woman the seat of hundreds of minute abscesses. The patient had had chills for a week before. Finally she began to have some pain in the right loin. The urine was practically negative. We found just a trace of albumin and some pus cells coming from the right kidney. On cutting the kidney partly open by a longitudinal incision along its outer border, it was quite remarkable how all these abscesses were entirely located in the upper pole, and ended in a sharp line at the junction between the upper and the middle thirds. The lower two-thirds were entirely normal. It must have been that the infection, probably in the wall of the artery feeding this area of the kidney, caused these little septic emboli. We amputated the upper third of the kidney and the patient became normal in temperature within 48 hours and had a very smooth recovery. She remained well, is now married, and has had two children. I think it was quite valuable to save this kidney as in pregnancy, with possible ureteral difficulties, two kidneys make the condition surely safer.

I have never seen such a complete reduplication of the kidney pelvis in such a definite way without a double ureter.

Dr. W. A. Jones, Minneapolis, read a paper entitled "Cerebral Sinus Thrombosis, with Case Report of a Psychosis and Hemiplegia, with Autopsy."

Discussion by **Dr. A. R. Colvin.**

Some 15 years ago I was asked to assist at a head operation in the case of a young woman upon whom a diagnosis of brain tumor had been made. She was mentally unusually bright at the time of the operation. She had suffered from intense headaches for about one year; was totally blind. The blindness had come on gradually. At exploration nothing was found. The patient was relieved for a short time and then began to suffer again and it was decided to explore again on the other side of the head with a very large flap. The bleeding was so great at the time that the girl practically died on the table from hemorrhage from the diploic veins. At autopsy no gross pathology of the brain itself was demonstrable, but the longitudinal, the two lateral, the sigmoid and the occipital sinuses were found to be obliterated and represented by fibrous cords except here and there where a tributary vein entered and in these areas a small space remained.

The first interesting thing was that this girl was not mentally disturbed at any time. On the other hand she was particularly bright. The second interesting point was the gradual and increasing blindness with finally total blindness and great headaches. The third interesting point was the tremendous bleeding at the time of operation; due of course to the collateral venous circulation through the bone.

I wish also to report a case of infectious sinus thrombosis as showing the relationship between blocking of the cerebral sinuses and disturbance of cerebral function.

A boy of 4 years, who had been ill for some time with enteritis, developed a left-sided suppurative mastoiditis. The mastoid was operated upon with subsidence of symptoms. In about a week later symptoms of mastoid trouble on the right side were noticed and a suppurative mastoiditis operated upon. The temperature which was 104 degrees continued however and some days later the right sigmoid sinus was opened, but no pathology demonstrated. The child's condition became progressively worse. The temperature remained high and irregular. Suddenly the temperature dropped to nearly normal. The pulse became less frequent, the child became unconscious, the head retracted, the pupils widely dilated with no light reflex present. After numerous consultations the concensus of opinion seemed to be that meningitis accounted for his symptoms. These did not, however, conform to the symptoms of meningitis as I had observed them, following mastoid infection, and I was quite sure that exploration for brain abscess would prove fatal under the circumstances. Shortly a swelling in the upper right neck, and a read streak along the direction of the great vessels to the clavicle, seemed to indicate jugular thrombosis. An operation for this condition was undertaken. A clot was found extending from the left sigmoid sinus (the side first operated upon) to the subclavian vein. The clot was removed and the vein excised; recovery ensued. The eyesight was restored. The boy is now mentally normal and bright. The facial veins have always stood out prominently. He had an operation for adenoids some years later and the bleeding was alarming. I suppose due to collateral channels being dilated. In this case, as in the one just reported, there had been no permanent interference with brain function as a result of bilateral blocking of the sigmoid sinuses.

This case and the two following ones emphasize again, as it has been emphasized by McEwen in the book on "Pyogenic diseases of the Brain and Spinal Cord," written many years ago, the necessity for hopefulness, and a running attack as pathology develops in any case of mastoid infection.

The next case was a young man thought to be beyond relief from pyemia as evidenced by a suppurating knee joint and several muscular abscesses. He was delirious. In a search for the cause of his pyemia, it was discovered that he had a suppurating otitis media with tenderness over his mastoid and along the course of the great vessels in the neck. The jugular vein was first exposed and found to be obliterated at about the middle of its course. On opening the vein above this point it was found to contain pus, and this extended up to the sigmoid sinus. After finishing the mastoid and sinus operation, the knee joint and numerous muscular abscesses were opened. Recovery followed.

The last case I wish to report was that of a young woman, 7 months pregnant, with mastoiditis, septic sigmoid sinus thrombosis and pneumonia with empyema. The mastoid sinus and empyema were drained. Recovery followed, and a living healthy child was born at term.

NEW AND NON-OFFICIAL REMEDIES

During December the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies:

The Abbott Laboratories:
Neocinchophen-Abbott.
Powers-Weightman-Rosengarten Co.:
Mercury and Potassium Iodid-P. W. R.
Schimmel and Co.:
Oil of Cypress-Schimmel and Co.
E. R. Squibb and Sons:
Liquid Petrolatum-Squibb.
Food Allergens-Squibb.
Pollen Protein Allergens-Squibb.
Animal Epidermal Extract Allergens-Squibb.
Bacterial Allergens-Squibb.
Winthrop Chemical Co.:
Chaulmestrol.
Nonproprietary Article:
Chaulmoogra Oil.

CHANGE OF AGENCY: Cresatin.—The Council has directed that the description of Cresatin (New and Nonofficial Remedies, 1921, p. 94) be revised to show that the name has been changed to Cresatin—Dr. N. Sulzberger and that it is manufactured by the Intravenous Products Company of America, Inc.

Bromipin 10 per cent.—A bromine addition product of sesame oil, containing from 9.8 to 11.2 per cent of bromine in organic combination. It acts like the inorganic bromides; but since it yields its bromine more slowly, it is thought to have less tendency to produce brominism. Bromipin 10 per cent is said to be more lasting in its action than the bromides. The dose is 4 c.c. (1 fluidrachm), which may be increased in cases of epilepsy to from 8 to 30 c.c. (2 to 8 fluidrachms). Bromipin 10 per cent is a yellow oily liquid, having an oleaginous taste. Merck and Co., New York (Jour. A. M. A., Dec. 3, 1921, p. 1819.

Amylzyme.—An extract containing all of the digestive enzymes of the fresh pancreas of the hog. It has the power to digest starch and protein and to split fats. It is claimed that it is of value in digestive disturbances resulting from a deficiency of pancreatic secretion. Amylzyme is sold only in the form of 2 grain capsules. G. W. Carnrick Co., New York (Jour. A. M. A., Dec. 10, 1921, p. 1891).

Theobromine-P. W. R.—A brand of theobromine-N. N. R. For a discussion of the actions, uses and dosage of theobromine, see New and Nonofficial Remedies, 1921, p. 362. Powers-Weightman-Rosengarten Company, Philadelphia (Jour. A. M. A., Dec. 10, 1921, p. 1891).

Potassium Mercuric Iodide.—Potassii Hydrargyri Iodidum.—A complex salt, K_2HgI_4, formed by the interaction of one molecule of mercuric iodide with two molecules of potassium iodide, containing about 25 per cent of mercury. Potassium mercuric iodide is used for the same purposes as mercuric iodide, over which it has some advantages because of its solubility. As a germicide, it is effective since it does not coagulate albumin; however, there seems to be no work to show how much the activity is decreased when an excess of potassium iodide is present. As a germicide, potassium mercuric iodide is used in concentrations of from 1:100 to 1:10,000. Solutions of potassium mercuric iodide may be prepared: (1) by dissolving one part by weight of mercuric iodide and one part by weight of potassium iodide in a small amount of water and then diluting to proper strength; (2) by dissolving potassium mercuric iodide in water containing potassium iodide, equivalent to about 20 per cent by weight of the potassium mercuric iodide used (Jour. A. M. A., Dec. 17, 1921, p. 1971).

Mercury and Potassium Iodide-P. W. R.—A brand of potassium mercuric iodide-N. N. R. Powers-Weightman-Rosengarten Company, Philadelphia (Jour. A. M. A., Dec. 17, 1921, p. 1971).

Diphtheria Toxin-Antitoxin Mixture-Squibb.—Each cubic centimeter of the mixture represents 3 L+ doses of diphtheria toxin and three units of diphtheria antitoxin. It is marketed in packages of three 1 cubic centimeter ampules representing one immunizing treatment; also in packages of thirty 1 cubic centimeter ampules. For a discussion of the actions and uses of diphtheria toxin-antitoxin mixture, see New and Nonofficial Remedies, 1921, p. 282. E. R. Squibb and Sons, New York (Jour. A. M. A., Dec. 17, 1921, p. 1971).

Oil of Cypress-Schimmel and Co.—A brand of cypress oil-N. N. R. For a discussion of the action and uses of cypress oil, see New and Nonofficial Remedies, 1921, p. 95. Fritzsche Bros., New York (Jour. A. M. A., Dec. 17, 1921, p. 1971).

Xeroform-S. and G.—A brand of bismuth tribromphenate-N. N. R., for a discussion of the actions and uses of bismuth tribromphenate, see New and Nonofficial Remedies, 1921, p. 71. Schering and Glatz, New York (Jour. A. M. A., Dec. 17, 1921, p. 1971).

Theobromine and Sodium Acetate-P. W. R.—A brand of theobromine sodium acetate-N. N. R. For a discussion of the actions, uses and dosage of theobromine-sodium acetate, see New and Nonofficial Remedies, 1921, p. 363. Powers-Weightman-Rosengarten Company, Philadelphia (Jour. A. M. A., Dec. 24, 1921, p. 2061).

PROPAGANDA FOR REFORM

Quinidin in Heart Disease.—Quinidin has suddenly leaped into prominence because of its striking effects in certain forms of cardiac irregularity. To see a heart that has been constantly irregular for one or two years because of a fibrillating auricle lose its lawless and rapid beat within a few hours under the influence of this drug and resume normal rhythm and rate and maintain these for months, must attract the attention of all. The conclusions of the few clinicians who have thus far reported their investigations are in remarkable agreement as to the fact that in about half of these cases of auricular fibrillation, quinidin is capable of restoring to the sino-auricular node the control of the heart, so that, for a time at least, the working of the heart is normal. However, while those who report on the effects of quinidin are fascinated by the possibilities of the application of this drug in medicine, they are wisely conservative in their statements and frankly admit that much is yet to be learned concerning its proper use. It is to be hoped that the few favorable reports will not lead to the indiscriminate use of the drug in every type of irregular and rapid type of heart (Jour. A. M. A., Dec. 3, 1921, p. 1822).

Oxygen Therapy.—The difficulties of oxygen therapy do not lie in any danger from undue intake of oxygen, for no abnormal increase in vital processes occurs even when mixtures very rich in oxygen are inhaled. The problem is rather one of technic in securing an actual introduction of more oxygen into the lungs under mechanical conditions of tolerable comfort. The usual haphazard methods of oxygen administration are of slight avail. When oxygen was administered with effective breathing devices in cases of cardiac insufficiency, relief of cyanosis and slowing of the pulse were secured. In pneumonia, the results were sufficiently impressive to permit the conclusion that oxygen therapy assumes a rational role in the treatment of the disease (Jour. A. M. A., Dec. 3, 1921, p. 1820).

Butyn.—The Council on Pharmacy and Chemistry reports that butyn is the name applied by The Abbott Laboratories to a new local anesthetic proposed for use in place of cocain in surface anesthesia in the eye and for anesthesia of other mucous membranes. Butyn is a chemical body, of definite, nonsecret composition, namely para-aminobenzoyl-gammadinormal-butylaminopropanol sulphate. Pharmacologic investigations indicate that butyn may take the place of cocain for surface anesthesia of mucous membranes and, that it may be superior for this purpose, and especially for use in the eye, to other synthetic anesthetics, for the reason that it can be used in materially lower concentrations. So far, however, the therapeutic value of butyn has not been proved by ade-

quate clinical trials. For this reason, the Council postponed the acceptance of the drug for New and Nonofficial Remedies and published a preliminary report on butyn for the information of those who wish to put butyn to clinical trial (Jour. A. M. A., Dec. 10, 1921, p. 1891).

Intravenous Specialties of the Intravenous Products Company of America.—This firm's list of specialties bears a striking resemblance to those of other "intravenous specialty" firms. Its Endoarsen, like Venarsen of the Intravenous Products Company of Denver, is stated to contain a cacodylate ("dimethylarsenate") together with mercury and iodid. Venarsen was reported on unfavorably by the Council on Pharmacy Chemistry, in 1915. The inferior efficacy of sodium cacodylate and its worthlessness as a spirocheticide have been demonstrated. Like other "intravenous" firms, this company advertises the intravenous administration of drugs such as sodium iodid and hexamethylenamin. The objections to and the dangers of indiscriminate administration of drugs intravenously was recently emphasized in a report of the Council on Pharmacy and Chemistry on "Some of Loeser's Intravenous Solutions" (Jour. A. M. A., Dec. 10, 1921, p. 1912).

"The Alsaker Way."—R. L. Alsaker advertises a series of "Books That Teach The Alsaker Way to Health and Efficiency." Rasmus Larrsen Alsaker was graduated by Bennett Medical College, Chicago, in 1910. Alsaker's book "Curing Diseases of Heart and Arteries" seems to be the book that is pushed at present. The first part of this book contains certain elementary facts of physiology and hygiene that could be found in the ordinary common school textbooks on such subjects. The therapeutic phases of the subject are so treated that the average reader might well reach the conclusion that all physicians, except Alsaker, are either fools or rogues, and that from Alsaker alone flows the only pure, unadulterated, 100 per cent medical knowledge. Alsaker's book may be counted on to have a very definite effect on the person who accepts its teachings. It may lead any patient, who because of an impaired circulatory system is under the care of a physician, to abandon such rational means as the physician might recommend and attempt self-treatment (Jour. A. M. A., Dec. 10, 1921, p. 1909).

Cod Liver Oil in Rickets.—While there is a growing belief that cod liver oil is of distinct therapeutic value in rickets, many of the experiments along this line are not sufficiently objective to be entirely convincing. Now, however, Park and Howland have furnished the direct ocular proof of the effects of cod liver oil on rickets which roentgenograms afford. The results in many cases have been so consistent that they feel justified in stating definitely that cod liver oil brings about a change in the bone which, if the diet is not too faulty, amounts to complete cure (Jour. A. M. A., Dec. 31, 1921, p. 2122).

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
DULUTH CLINIC, DULUTH

THOMAS A. PEPPARD
LA SALLE BLDG., MINNEAPOLIS

Abstracts from recent Medical and Public Health Papers, by Division Venereal Diseases, U. S. Public Health Service.

VENEREAL DISEASE AND MENTAL DEFICENCY, (In England). (Editorial, Public Health Administration, Municipal Engineering and the Sanitary Record, London, July 28, 1921.) "In Staffordshire, Dr. A. G. Wilkins has investigated nearly 600 cases of mental deficiency. It must not be forgotten, he urges in his annual report 'that the number of mental defectives is likely to increase owing to the spread of venereal disease throughout the country. This national calamity is shown by the sudden rise in infant mortality attributed to syphilis in 1917 and the greatly increased number of notifications of gonorrheal ophthalmia in 1919 as compared with 1918. Our medical staff have made some preliminary inquiries into the relation between mental deficiency and venereal disease, and find no reason to doubt the essential accuracy of Dr. Mott's statement that there is some relationship and that as much as 8 per cent of mental defectives give a positive Wassermann reaction.'

"We are informed that Dr. Edith M. Guest has examined the records of 41,719 Staffordshire children of age group 12-13, and found that of a group of 44 diagnosed as syphilitic 4.5 per cent were also mentally defective, whereas of the remainder only 0.4 per cent.

"Further evidence is given by Capt. A. F. Wright, Venereal Disease Officer to the Staffordshire County Council, who examined the blood of 50 mentally defective school children in Sedgley and Willenhall, and reported that 36 per cent showed traces of syphilis, half of which had been diagnosed as 'word blind,' while 25 per cent were certainly syphilitic."

CASES OF STILL-BIRTH, (in Glasgow). (Notes and Comments, The Medical Officer, London, July 2, 1921.) In the Glasgow health report of the years 1914-1919, Dr. A. K. Chalmers, M. O. H., includes the results of an inquiry extending from 1917 to 1920 into the causes of still-birth as shown by the examination of the foetus at the municipal laboratories. The work has been carried on under the supervision of Dr. R. M. Buchanan. . . . .

The apparent age of the foetuses examined varied from 4 months to 9 months, rather more than half

of the 255 examined being within a fortnight of the latter age. The proportion of cases in this series in which syphilis was undoubtedly the cause of death is certainly smaller than anticipated, for the number found was only 13 out of 255, approximately 5 per cent. It should be noted, however, that the dark ground method of examination for spirocheta pallida was not employed in the first 49 examined; had it been so the percentage would probably have been somewhat higher, for in the remainder of the series the percentage works out at 6.5. It was also observed that the presence of syphilis could be demonstrated in a relatively large number of foetuses in the earlier miscarriages, so that had it been possible to obtain specimens at earlier dates than those included in the series the proportion might have been still further increased.

STILL-BIRTH: ITS CAUSES, PATHOLOGY AND PREVENTION. (Francis J. Browns, British Medical Journal, July 30, 1921.) Browns bases his report on 200 consecutive cases of still-birth and neo-natal death occurring in the Edinburgh Royal Maternity Hospital. There were altogether 35 cases of syphilis.

A REVIEW OF THE LITERATURE AND A DISCUSSION OF SILVER ARSPHENAMIN. (H. E. Michaelson and David M. Siperstein, Arch. of Dermat. and Syph., Aug., 1921.) Michelson and Siperstein review the literature, which is confined to the German. Silver arsphenamin was suggested by Ehrlich, and finally elaborated by Kolle. The drug was first used clinically in March, 1918. Results of investigation by Kolle, Fabry, Galewsky, Gennerich, Hahn, and many others are given. Authors conclude, after a careful survey of the literature and as a result of a limited personal use (250 ampules), "We feel that we may safely state that silver arsphenamin is an efficient spirocheticide, which has a pronounced effect on the visible lesions of syphilis." The consensus of opinion of the many observers is that in the majority of cases of fresh syphilis a positive reaction becomes negative after the first course of from six to ten injections of silver arsphenamin.

There is considerable variation in the dosage. An initial dose of from 0.05 to 0.1 gm. for a person of average weight is best—with a routine dose of from 0.2 to 0.25 gm. Authors recommend technic: Dissolve the necessary dose in 10 c.c. of sterile distilled water, draw into a 20c.c. Luer syringe, make venipuncture, aspirate about 10 c.c. of blood, and reinject the entire solution slowly.

One of the distinct advantages is the absence of the odor which characterizes the other arsphenamins. This odor has made it impossible, or at least impracticable, to administer arsphenamin to certain patients.

There is no difficulty in determining the oxidized product. A spoiled product has a dull, muddy, grayish brown appearance, instead of the rather sparkling, clear, dark brown solution.

The interval of choice is from four to seven days, and the number of doses in a course varies greatly.

The majority of observers are not in favor of using silver arsphenamin and mercury simultaneously.

There is apparently no reaction due to silver arsphenamin which is peculiar to that drug and has not been noticed with any of the arsphenamin group, with the possible exception of argyria.

Silver arsphenamin is a more complex salt than any of the other arsphenamins and the physician must be on the alert for the slightest sign of intolerance.

Although the drug has been highly recommended by neurologists, nothing conclusive has been published indicating a selective action on neurosyphilis.

A NEW TREATMENT FOR SYPHILIS. (Paris Letter, Journal A. M. A., July 23, 1921.) Drs. Levaditi and Sazerac of the Pasteur Institute presented a communication to the Academy of Sciences concerning the use of a new substance in the treatment of syphilis; namely, potassium sodium bismuthate. This substance is still in the experimental stage. Intravenous injections of a watery solution of this compound were made in three syphilitic rabbits. The following day no spirochetes could be found in the blood. No recurrence four months later. Prompt cure of the primary symptoms of syphilis in man has been brought about, also the disappearance of the spirochetes from the blood. But no final conclusions, the author states, can yet be drawn from these experiments for several years.

RESULTS OF CENSUS OF PERSONS AFFECTED WITH VENEREAL DISEASE, (in Germany). (Berlin Correspondent, Journal A. M. A., August 27, 1921.) A preliminary official report has been published of the results of the census of persons suffering with venereal disease, which was taken in Germany during the period from November 15 to December 14, 1919. During this period 136,000 civilian and army men were under treatment for venereal disease or its sequels. In other words there were 22 venereal patients to 10,000 of population. In many large cities the average rate of 0.22 per cent was exceeded: Berlin 0.76; Hamburg 0.67; and Lubeck 0.49 per cent. However, since in the large cities there are proportionately more unmarried men from 15 to 30 years of age (the dangerous period) than elsewhere, it is not justifiable to draw from these figures the definite conclusion that there is a greater spread of the diseases in the cities. The figures for the several states of Germany are not essentially different.

A comparison of statistics rcently obtained with those based on the census of 1913 does not show that venereal disease in Germany have materially increased. The incidence is most frequent in men and women in the 20-25 age group. The second most

frequent incidence occurs in both sexes in the 25-30 age group, but after this a differentiation is noticeable, since the third most frequent incidence in men is during the period from 30 to 40; in women from 15 to 20. Of the men the unmarried group is most affected; then come the divorced, next the married group, while widowers come last. With the women the relationship is different: the divorced are most affected, then come the unmarried, next the married, and widows come last.

REGISTRATION OF SYPHILITICS (in Denmark). (O. Jersild Ugeskrift for Laeger, June 2, 1921. Control of Venereal Diseases, Lancet, London, July 9, 1921.) In Denmark a system of registration has existed for about half a year. The Wassermann reaction is carried out only in one institute and under state control. The machinery for the Wassermann reaction being centralized it was comparatively easy to evolve a system of registration centering about this reaction. The Wassermann forms have been worded so as to serve the double purpose of serological report and registration. Notification is thus almost automatic; it is confidential as identification data supply the place of names.

In practice it has been found that syphilogists are apt not to make use of the test the first few years after infection. To overcome this difficulty they have been supplied with special registration forms. Although registration has existed only half a year, about 10,000 persons have already been entered on the Serum Institute's registers.

TREATMENT OF TUBERCULOSIS ADENITIS: Russel H. Boggs. (Amer. Jour. Med. Sc., Vol. 162, July 1921) strongly advocates the use of radium and roentgen ray in the treatment of tuberculous adenitis. Formerly radiotherapy was used in the treat- unsightly scars; today this treatment is advised because more permanent cures are obtained than by any other method, especially when an early systematic raying is employed. Radiotherapy alone will cure 90 per cent of these cases. Such treatment entails no danger of spreading the disease, produces no unsightly scars, and sacrifices no tissues as does surgery. Furthermore, such treatment produces a systemic effect similar to successful tuberculin treatment with more dependable results. Other methods of treatment are apt to increase the patient's susceptibility to the disease by lowering his vitality. By raying the local infection in the gland, its hypersusceptibility is reduced which prevents spreading of the disease. The author further states his belief that the susceptibility to the development of tuberculosis is always greatly lessened after a few radiations, and that the patient, at least in some cases, is rendered immune.

Surgery should be limited to the removal of hard fibrous nodules which follow radiotherapy. These seldom ever contain any tuberculous foci, but it may be advisable to remove them thru a small incision the same as any foreign body.

It is to be remembered that large cervical glands may be due to sarcoma, Hodgin's disease, leukemia, etc., and that radiotherapy is still the best form of treatment for multiple glandular tumors, but the end results are not the same as when the enlargement is due to tuberculosis.

R. M. EPPARD.

SURGERY

SUPERVISORS:
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THE TECHNIQUE OF GALL-BLADDER SURGERY IN THE PRESENCE OF JAUNDICE: Crile (Surg., Gyn. and Ob., Volume 33, No. 5.) points out that in jaundiced patients demanding operation one prime risk is encountered, i.e., exhaustion. The liver is as necessary to the maintenance of life as the brain or the heart. Any impairment in the integrity of the liver is accompanied by a corresponding impairment of the brain cells. It follows that when an operation is required in the presence of jaundice and depression of the failing resources of the patient, that is, the remnant of the liver function, must be scrupulously preserved; and, if possible, the margin of safety increased. In these cases the internal respiration is seriously impaired. The conservation of the internal respiration of the cells depends upon oxygenation, water, and neutralization of excessive acids.

All inhalation anesthetics interfere with internal respiration. It is depressed by cooling and promoted by heat. The continuous uncontrollable fall of the temperature of the brain following excision of the liver is equalled by the fall of the temperature of the brain during surgical anesthesia under ether. Under nitrous oxid-oxygen anesthesia the fall of the temperature of the brain is but slight, and under analgesia it is negligible. Analgesia gives freedom from fear, worry, or anxiety; it mitigates the sense of pain about eighty per cent, and the balance can be covered by local anesthesia.

Crile states that as a result of experience of the recent war together with the findings of certain researches, an all important principle has been introduced into the surgery of the bad risk patient. The management and treatment is based on probability and not on the state of the patient at the moment.

The function of the liver is depressed by narcotics, especially morphine. In operating on jaundiced patients the exposure should be as slight and as brief as possible, and hot packs should be applied immediately after operation.

Blood Transfusion promotes oxygenation if the cells and saline infusion aids in maintaining the water equilibrium and the acid alkali balance. Therefore, these last two measures should be carried out either before or after operation.

In grave cases, the operation should, if possible, be divided into two distinct physiological stages. The first stage should include only such measures as are required for the relief of the biliary obstruction, wholly disregarding any manoeuvre for the removal of the stones unless they are in the way. The ultimate operation can well be delayed until the danger point is passed, and the stability of the liver cells and of the brain cells has become established.

E. MENDELSSOHN JONES.

CLINICAL AND EXPERIMENTAL OBSERVATIONS IN THE USE OF SALINE IRRIGATION IN THE TREATMENT OF DIFFUSE PERITONITIS: A. Murat Willis (Surg. Gyn. and Ob., Oct. 1921.) points out that in recent years there has been a decided reduction of the mortality accompanying diffuse peritonitis. There are several factors that have contributed to this improvement of results, namely; Early operation, the free use of water or salt solution by rectum combined with subcutaneous injection of normal salt solution. There are other details of treatment, however, about which surgeons are not in such perfect accord.

Irrigation in peritonitis is one procedure over which there is considerable difference of opinion. The objections raised to the use of saline irrigation in the presence of diffuse peritoneal infections are the following:

(1). It tends to produce shock by subjecting the patient to a longer operation.

(2). It traumatizes the peritoneum and accelerates absorption.

(3). It washes off the defensive Phagocytes and removes the protective exudate.

(4). It spreads infectious material from the primary focus to areas of the peritoneum that had not previously been involved.

The author brings out that these objections may appear to constitute a severe indictment against the practice of peritoneal irrigation but a closer analysis reveals that the basis upon which they rest is more fancied than real.

It is true that long exposure of the intestines to the air with the resulting drying joined to the trauma of excessive handling will give rise to a condition similar to surgical shock. Prolonged etherization also will much reduce the resistance of animals to intraperitoneal infection, but these factors are by no means necessitated in employing irrigation clinically. The author does not feel that the added few minutes demanded by irrigation are more apt to cause this so-called shock than is the hasty, ill-executed operation performed in accordance with the too literal acceptance of the dictum: "Get in quickly, get out quicker."

When one fills the cavity and covers the intestines with warm, isotonic salt solution and is careful to avoid mechanical insult to the tissues, it would seem that there is far less tendency to trauma than when the intestines are exposed to the drying influence of the air.

The exudate originally contains phagocytes and unformed defensive products but later in the disease it teems with virulent bacteria and hence removal of the greater part of the peritoneal exudate by irrigation should be very beneficial. No one advocates irrigation of the uninvolved peritoneum in the presence of a definitely walled off abscess, but it is used when dealing with a diffuse process.

In favor of the use of free irrigation with normal salt solution in appropriate case the writer states:

(1). It lessens the tendency to shock by preventing undue loss of heat through the use of a solution slightly above body temperature and also through the prevention of drying of the exposed intestines.

(2). It mechanically washes out a certain number of unabsorbed bacteria, and at the same time, fibrin, blood clots, pus or intestinal contents which may serve as foreign material, facilitating the growth of the bacteria.

(3). It serves to dilute those toxins which are not removed at the time of operation, unless removed these must be destroyed in the tissues or eliminated unchanged, and, if one be permitted to reason by analogy, dilution will markedly lessen their injurious actions.

(4). The peritoneum is an absorbing surface of great activity.

The author believes that these arguments based upon theoretical consideration do not tend to show that irrigation of the peritoneal cavity in the presence of a diffuse peritonitis is a reprehensible procedure. One should only be influenced by actual results in making a decision rather than theoretical considerations, no matter how logical the matter may seem.

The article also contains an account of some experimental work carried on by the author.

E. MENDELSSOHN JONES.

INDICATIONS FOR THE SURGICAL TREATMENT IN DIFFERENT TYPES OF GOITRE: W. E. Sistrunk, (Surg. Gyn. and Obst., Oct. 1921, Page 348).

Plummer states that there are only three types of goitre-colloid, adenomatous and exopthalmic, and that other types seen clinically are just variations or combinations of these three.

1. Colloid Goitre—is the goitre of youth, rarely seen in people of 30 or 35 years. They may possess some of the symptoms of the exopthalmic—but the basal metabolic rate is never increased. The Goetsch test gives a marked reaction and thus leads

one astray in calling this type the exopthalmic variety. Microscopically, this type shows dilated acini filled with colloid, and the lining epithelium is low and flat in appearance. It is the only goitre disappearing under the use of iodin or thyroxin, and should not be considered surgical.

2. Adematous Goitre—is the most common type, originating in early life—and may be slow or rapid in its growth. Degenerative changes are prone to occur as a result of hemorrhages, and from this the various varieties such as hemorrhagic, cystic, fibrous and calcareous, receive their names. Hypothyroidism may result. Plummer stated that 23 per cent of patients with adenomas examined at the Mayo Clinic presented symptoms of hyper-thyroidism, but these symptoms had not developed until the goitre had been present for an average of 16 years. This associated hyperthyroidism presented a picture different from that seen in exopthalmic goitre. The cardio vascular system suffers more in this condition while in exopthalmic goitre the nervous system is more affected. Adenomas are best treated surgically, but it is usually best to wait until the patient is 25 or 30 years of age. It is best to remove adenomas in a healthy person before toxic symptoms have developed. The operative risk in those who are toxic and show advance myocardial changes, is always greater.

3. Exepothalmic Goitre—may occur at any age but generally in third and fourth decades. It may develop very rapidly with severe symptoms at onset, or very slowly and not become very bad until second or sixth month, and pass through a crisis. They then may improve considerably—but are pretty apt to have a recurrence. Marked changes in vital organs may leave those who survive these crises in a state of chronic invalidism. Best results are obtained through surgery. Judgment in the selection of the type of operation for each individual case is absolutely necessary. Patients are usually extremely dangerous during the crisis, and should be treated by means of rest, fluids, and careful nursing.

Determination of basal metabolic rate is a great aid in diagnosis of early stages of exopthalmic goitre. It is a definite index at the time it is taken of the amount of hyper-thyroidism but gives no indication of the amount of damage already done.

W. C. CARROLL.

CANCER OF THE BREAST: Byron H. Davis, (Arch. of Surg. Sept. 1921, Pages 348-356.) The author reports 190 cases of cancer of the breast of which he has been able to trace 122. Of this number, seventy-five were free from recurrence for from three to twenty-one years and forty-seven were reported as having died or as suffering from a hopeless recurrence.

No one any longer reports his cancer patients as cured—a three or five year limit is purely arbitrary. The author has had patients remain apparently well for five, eight, ten years, and then report a recurrence from which they soon died.

The length of time the existence of the lump in the breast has been known and the apparent extent of the disease at the time of operation are not nearly such good indexes of the prognosis as one would theoretically suppose. The discovery of the lump is usually accidental, bearing no definite relationship to the date of the beginning of the disease, or to the extent of its dissemination. Some of the patients with apparently mammary and axillary involvement have been free from recurrence for many years while several patients with only a small lump in the breast, recently discovered, with no apparent extension to the axillary or other glands, have died of early and rapid carcinoma. The author reports two illustrative cases and states that there are degrees of malignancy of carcinoma of the breast.

Local recurrence should not be considered the sounding of the death knell. Several of the author's patients have been operated upon for a first, second and even third recurrence and are still alive and apparently free from disease up to ten years after the last recurrence.

When one can make a positive preoperative diagnosis of cancer, it is too late for the best average results. The ideal operation for mammary carcinoma is the one that starts in as an exploratory incision.

The author believes that the most usual precancerous lesions recognizable in the breast are benign tumors and chronic mastitis and urges the removal of all benign breast tumors and the amputation of breasts that are the seat of chronic mastitis.

The most important lymphatic highway leads from the breast to the axillary glands. Invasion of the axillary glands is usually the first point of attack outside of the breast and pectineal fascia. Occasionally, the lungs, the liver and other organs are invaded first and, in rare instances, the patient may die without the axillary glands having been involved.

Cancer cells may reach the mediastinum, the lungs or the pleura by growing along the lymphatics that accompany the perforating branches of the internal mammary artery. About 50 per cent of late cancer cases show invasion of the thoracic cavity.

The author had eight cases which later developed cancer in the opposite breast. Invasion of the peritoneal cavity and liver occurs in the course of this disease. Invasion of the liver has been found in 36.6 per cent of the cases.

The author believes that intensive postoperative x-ray therapy increases the prospects of permanent relief.

Occasional cases are encountered in which it is better not to operate. Those mentioned are: 1. Deep involvement of chest wall; 2. Firm fixation of the tissues to the chest wall; 3. Fixation of the axillary mass; 4. Very extensive skin involvement; 5.

Enlarged and fixed supraclavicular glands; 6. Secondary growths on the lungs, liver or other viscera; 7. Bone metastasis.

The author believes the time is coming when 70 or 80 per cent of patients with carcinoma of the breast may be permanently relieved.

FRED R. SANDERSON.

ROENOLENTGOGY

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TUMORS OF NERVE TISSUE IN RELATION TO RADIATION. James Ewing. (Amer. Jour. of Roent., 1921, Vol. VIII, No. 9, Page 497.) Structural characters which determine susceptibility to radiation are: (a) Cellular character; (b) undifferentiated form of cells; (c) rapid growth with abundance of mitosis; (d) vascularity, especially if delicate capillaies; (e) absence of much intercellular substance.

There is a wide variation in the above particulars in the tumors that affect nerve tissue, and from their structural characteristics one would expect the following reactions to radiation: (a) Neuro-fibroma —exceedingly resistant; (b) psammoma—mildly inhibitory unless radium can be applied directly; (c) endothelioma—as a whole rather unfavorable unless of vascular or cellular type; (d) angio-sarcoma—ought to be markedly influenced by radiation and very difficult surgical removals; (e) glioma—ought to yield readily to moderate radiation; (f) primary carcinoma—deeply situated and well protected but their delicate structure would indicate favorable results; (g) hypophyscal tumors—promlematic but the clinical symptoms are delicate indicators of any therapeutic effect and under this field of unusual interest.

The application of radium to intracranial or intraspinal tumors is not unattended by difficulties and dangers. The adult skull and brain will absorb ten per cent of gamma rays passing through 2 m.m. of brass. So to treat centrally placed tumors an increase in dosage, distance, and time must be provided and the quantity of radium necessary restricts this therapy to institutions possessing a large amount.

The damage to normal brain tissue is not such a grave problem as actual caustic necrosis of the scalp may accomplish without structural changes in the normal brain. A more important danger is the increased intracranial pressure that results from the radiation in a brain which is already suffering from the effects of increased intracranial pressure. Therefore, unless the patient can stand a temporary increase in pressure, the application of radium may be followed by aggravated symptoms.

If the tumor can be exposed, the most effective method is the direct insertion of radium into the tumor. No surgical removal of a part of the tumor should be attempted as the mass serves as a protection to surrounding normal tissue. Surgery increases the possibilities of infection and tissues exposed to radiation are more susceptible to infection.

In closing, the author states that the problem is one of clinical research, and warns against it being undertaken by anyone except the experienced neurological surgeon and radium expert. The only safe guide is eyperience.

A. U. DESJARDINS.

SOME REMARKS ON THE PRESENT STATUS OF X-RAY THERAPEUTICS. Geo. W. Holmes. (Amer. Jour. of Roent., 1921, Vol. VIII, No. 9, Page 522.) Doctor Holmes read this paper before the New York Roentgen Ray Society on the 25th anniversary of the discovery of x-rays. He stated that the radiotherapeutist had failed to keep step with the physicist and the biologist.

I. Method of Determining the Amount of Radiation.

The indirect method, of determining the amount of radiation coming from the tube by measuring the amount of electrical energy supplied to the tube, is most used in America. It is more accurate than the old direct method and the ionization chamber method has not yet come into fair trial.

II. Method for Determining the Quality of Radiation and the Selection of Different Qualities for Different Diseases and Conditions.

Present tendency is to place more emphasis on quantity and to use rays of a shorter and shorter wave length. However, still some place for unfiltered rays. Tendency is to increase the target-skin distance and this is decidedly advantageous.

III. Effect of Radiation upon Normal and Pathological Tissue.

The author quotes Doctor R. B. Greenough's summary:

(1) Living tissue may be destroyed en masse.
(2) Growth may be temporarily inhibited.
(3) Rapidity of growth may be stimulated.
(4) Manner of growth may be modified.

Holmes remarks that when it is not possible to destroy deep seated disease, radiation should be sufficiently frequent to maintain its inhibitory powers.

IV. The Effect of Treatment Upon the Individual as a Whole and His Re-Action to it.

The exact cause of treatment-sickness is not known but probably is due to several causes, the most active being some obscure change in the blood. Another general effect is an increase of metabolism and an improvement in the general well-being of the patient.

In handling a patient with malignancy, complete surgical removal should be done if there is no metastasis. In the latter event, there is a choice be-

tween a radical attempt at destruction of the malignant cells without regard to the patient's comfort or merely to attempt to inhibit the growth and confining the dose below that which would cause a painful erythema. The latter procedure is the more rational.

Surgery breaks down the natural resistance and interferes with the walling-off process which is the result of connective tissue stimulation.

Today there is need of better coöperation with the internist and surgeon.

A. U. DESJARDINS.

GYNECOLOGY AND OBSTETRICS

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PERFORATING HEMORRHAGIC (CHOCOLATE) CYSTS OF THE OVARY. John A. Sampson. (Arch. of Surg., Vol. 3, No. 2.) The author calls attention to a peculiar type of hemorrhagic ovarian cyst which is important from two standpoints: (1) Frequency and (2), the nature of the adhesions resulting from the escape of its contents. These cysts may be bilateral, usually from 2 to 4 cm. in diameter and develop in women during menstrual life, 30 years to menapause. The contents escape and give rise to dense adhesions in the culdesac or to adjacent structures, suggesting an inflammatory reaction. Sampson has found tissue of the endometrial type lining the wall of these hematomas and also in the structures which are involved in the adhesions which may be: the broad ligament, fallopian tube, vesico-uterine fold, culdesac, post wall of the uterus, supravaginal portion of the cervix and rectovaginal septum. Such endometrial tissue becomes a menstruating organ, and is filled with blood which may escape or extend in the tissues and allow implantation or extension of the adenomyoma.

It is impossible to review this exhaustive study in any detail. Dr. Sampson presents a most fascinating explanation of the relation between these hemorrhagic cysts and pelvic adenomata of the endometrial type. Detailed pathologic studies of twenty-three cases together with excellent illustrations are presented, demonstrating pathological changes resembling that of the various common examples of adeno-myoma.

Sampson quotes Novak's classification of ovarian hematomas: (1) follicular including, Graafian Follicle and atretic follicles. (2) Corpus luteum, and (3) Stromal. A fourth variety or hematoma is added, namely one which is lined wholly or in part by "endometrial" tissue, and the author quotes several examples from the literature, besides his own which are described in detail. Endometrium corresponding to that found in extopic edenomyomata can be demonstrated in his specimens. The author presents several possible explanations of the origin of such endometrium but does not care to make a definite statement at present. Twenty-six such cysts are arranged into three groups: (1) Showing retrogressing corpus luteum membrane, with areas near the perforation which are lined by epithelium, low, cuboidal, or columnar, resting a vascular, cellular stroma, often with glands. These suggest either development of an endometrial cyst from invasion of a follicular hematoma by misplaced edometrial epithelium, or else the regeneration of the epithelial lining of an edometrial cyst associated with menstrual hemorrhage. (2) Possibly a different stage of the preceding, with lining of epithelium resting on narrow layer of stroma. (3) Wall is composed largely of ovarian tissue but in places, especially about the perforation, one can demonstrate edometrium. Various phases of the menstrual cycle can be demonstrated in such cysts. The process of repair is not as rapid as in the uterus and the repeated hemorrhages may eventually destroy the cyst. Such "menstrual" blood escaping allows the extension or implantation of the epithelial tissue and gives rise to other foci of endometrium.

The adhesions which develop about such perforations with hemmorhage were always regarded as being the result of infection or irritation. This was formerly the belief of the author and his interest in this type of cyst was confined to the view that these were misplaced endo-metrial hematomas and that the adhesions were due to the irritating influence of menstrual blood. Associated adenomyomata were regarded as examples of multiple foci of misplaced endometrium. During the past year all tissue which was involved in such adhesions was studied microscopically, of 23 such cysts, pelvic adenomata of the endometrial type was found in 13. These are grouped as follows: (1) Adhesions obliterating the coldesac with adenoma of the endometrial type invading the cervix and rectum. The author is convinced that the ovary is the primary site of such growths. (2) Adhesions between the rectum and uterus with invasion of the posterior surface of the uterus with such adenomata. (3) Adhesions in normal peritoneal folds and development of adenomata on the utero-sacral, broad ligaments, round ligaments, or in the utero-vesicle fold. (4) Discrete nodules of adenoma in the wall of the rectum or sigmoid.

In considering the origin of adenomyoma of the uterus, there are two possible sources. (1) From within by an invasion of the uterine wall by the mucous lining. (2) From without as herewith described.

Clinically these cysts and sequelae occur between 30 and the menopause. Pain when present is most marked during menstruation. The cysts are small and often adherent, may simulate a malignant ovarian cyst.

Treatment. It is possible that the menopause may limit the growth of such adenomata but this is not determined. The primary ovarian cyst should always be removed. The author follows the lines of conservatism in surgical removal of involved tissues.

ARCHIBALD L. MCDONALD.

PEDIATRICS

SUPERVISORS:
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CHILDREN'S CLINIC, MINNEAPOLIS.
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MANKATO CLINIC, MANKATO.

EXPERIENCE IN MORE THAN ONE HUNDRED CASES OF EPIDEMIC ENCEPHALITIS IN CHILDREN: Josephine B. Neal. (Arch. of Ped., Aug. 1921.) The author gives a brief resume of the literature on this subject. She states that in a series of cases there were 50 per cent more males than females. The seasonal distribution showed the maximal number of cases in the first quarter of the year. In only one instance in this series there were two cases in the same family, and these two became ill on the same day. The mortality of the cases over 15 years was 27 per cent. The most promof those 15 years was 27 per cent. The most prominent symptoms were fever, vomiting, headache, malaise and those referable to the nervous system. Some of the patients were drowsy and some delerious. In some instances there were ocular disturbances, diplopia, blurring of the vision, strabismus nystagmus, convulsive movements of the eyeball, etc. The cranial nerves were most often effected. Kernig's sign was not common unless associated with spasticity. Pneumonia was the most dangerous complication. The spinal fluid findings were precisely the same as those in poliomyelitis. The cell counts were between 100 and 150. There was a slight increase in albumin globulin, and the sugar content. The most common conditions from which encephalitis lethargica must be differentiated were tuberculous emningitis, brain abscess, brain tumor and poliomyelitis of the encephalitic type. The most ccmmon sequelae were weakness and paralysis. Changes in speech and mentality were observed in 3 adults and in 10 children.

R. N. ANDREWS.

BODY FATIGUE IN MALNUTRITION OF CHILDREN: Borden S. Veeder. (Arch. of Ped., Aug., 1921.) The author states that for a number of years he has taken considerable interest in group of underweight and thin children with no striknig pathological condition, most of them coming from homes of good economic circumstances so that lack of proper food seemed not to be the cause of the malnutrition. He felt that in some instances bad posture was the cause of the gastrointestinal disturbances presented. He was inclined to attribute the condition to heredity, but found that this did not seem to furnish any satisfactory explanation. After observing two or three cases in the home he came to the conclusion that the basis of the condition lay in fatigue, and treatment based on that theory gave prompt results. If one watched these children it was found that they became tired in their play, and forgot to relax. The causes of the fatigue might be multiple; such as bad posture, over work, over play, or over study; too many parties, too many movies, too much excitement and too little rest and relaxation might explain the condition of these children who were simply underweight and under par and in whom there was no definite pathologic condition. The removal of physical defects was not the entire solution of the problem; one must study the environment and among other things see that the proper amount of sleep was obtained. The necessary sleep required is as follows: A child of 1 to 2 years required 13 hours sleep in 24 hours; 2 to 4 years of age required 12 hours; from 4 to 6, 11 hours; from 6 to 10, 10 hours, and from 10 to 14, 9 hours. Let it be understood that this is the minimum and some individuals require more.

In closing the author again emphasizes the importance of rest and relaxation in relation to the general health of the child and the problems of malnutrition. These he considered were needed as much as proper clothing, bathing, care of the teeth and proper diet.

R. N. ANDREWS.

ABDOMINAL SURGERY IN INFANCY FROM THE PEDIATRIC VIEWPOINT: F. C. Rodda. (Jour. Lanc., Sept. 1921.) Surgery in the infant presents some very especial problems which must be appreciated to obtain the best results. In the infant we are dealing, not only with a smaller organism, but also with one presenting peculiarities.

1. The infant's body differs from the adult's anatomically, histologically, and even chemically.

2. It is more susceptible to extreme metabolic disturbances.

3. It is a more unstaple organism than the adult.

4. It possesses little resistance, and practically no immunity.

In the diagnosis of these disorders in the infant subtle difficulties are encountered. Reliable subjective symptoms are not obtainable. There is complete lack of co-operation on the part of the patient with consequent difficulty in interpreting the physicial findings. Pain in the infant manifested by crying, doubling up the extremities, and unusual postures may betoken pneumonia, gas pains, pleurisy, earache, hunger, appendicitis, mechanical irratation, or pyelitis. A suspected localization may prove misleading. A distended or hyperesthetic abdomen may be found in all of these conditions. No abdominal surgery should be undertaken until a complete physical examination has been made. This should include inspection of throat and ears, care-

ful percussion and ausculatation of the chest, and a microscopical study of the urine.

The surgical care of the infant is very important. We have long known that from lack of food and water, or as a result of vomiting, purging, and diarrhea, a child will lose rapidly in weight. This has been shown to be due primarily to a loss of body fluids, and often at the end, result in a state of acidosis. In the light of these considerations preoperative starvation and catharsis might prove disastrous. Fluids in the form of normal saline or glucose solution should be given freely before operation. Further post-operative starvation and withholding of fluids is a serious handicap.

The adult has an admirable heat control, but in the child the reverse is true. Chilling is conducive to shock. The operating room should be very warm, the infant surrounded with hot water bottles, and exposed as little as possible. In addition the shorter the operating time the less anesthetic is required, and this is not a negligible factor.

Loss of blood is of grave importance to the infant It produces shock, increases dehydration, debilitates the infant, and reduces its immunity.

Finally these babies should be isolated as they possess practically no immunity to infection. They should be placed in a room where the best isolation is obtainable and the best aseptic nursing practiced.

R. N. ANDREWS.

BOOK REVIEWS

PATHOGENIC MICRO-ORGANISMS—McNeal—second edition. P. Blakiston's Son & Company, Publishers. $4.00.

This book presents the subject of bacteriology in a most entertaining, as well as comprehensive, manner, and will be more appreciated by the practising physician or general laboratory worker than by the highly spcialized technical bacteriologist. This is due to the fact that instead of a detailed discussion of the characteristics of the various bacteria, they are treated in a more abstract manner with special reference to allied subjects such as public health or pathology. In this edition the subject has been brought up to date with references to the recent literature.

The introduction differs from the usual one in that special attention is given to the bearing on hygiene, pathology, and agriculture. The first chapters, dealing with the use of the microscope and the simple principles of bacteriological technique, seem unnecessarily detailed when compared to the broader, more general treatment of the other subjects. Of especial interest are the somewhat unusual chapters on "Parasitism and Pathogenesis," "Pathogenic Property of Micho-organisms," and "Reaction of the Host to Infection," as well as the following brief but comprehensive chapter on immunity.

The molds and yeast and the diseases caused by them are exceptionally well done and definitely clarify a somewhat confusing subject.

Of special value is the broad yet comprehensive treatment on diphtheria, tuberculosis, and syphilis, in which their respective pathology and immunity are given a very definite place. Other chapters of interest are those on "Filterable Microbes," "Mastigophora," and "Sporozoa" in which the most recent investigations of these subjects are given. For every person interested in the science of medicine this book will not only prove to be interesting but will also leave a very clear and modern conception of the nature, action, and effects upon human life of the pathogenic micro-organisms.

MARGARET WARWICK.

OBSTETRIC PRACTICE. Berkeley & Bonney (P. Blakiston's Son & Co., $11.00).

On the cover of the book we find the above title. On the first page of the volume, however, we find "The Difficulties and Emergencies of Obstetric Practice." The latter title is more in keeping with the reading matter of the book.

Having dealt with the difficulties in the diagnosis of pregnancy, the author takes up the disorders of the various organs and systems which may manifest themselves during pregnancy, such as the intestinal tract, urinary tract, the vascular system, etc.; the infectious fevers, the specific infections; tumors and displacements; hemorrhages at different times of pregnancy; the various complications of labor from whatever cause, etc., the complications of the puerperium and then devotes a chapter to the diseases and injuries of the newborn and a chapter to feeding.

Furthermore, the subdivisions of the subjects, such as etiology, diagnosis, symptoms, treatment, etc., are all indicated in bold type so that the reader need waste no time in finding what he wants. The text is brief and to the point, no time or space is taken up with embryology and theory. A short paragraph, some times a few lines and often a single line contains all the author has to say. This is a good book.

ALBERT G. SCHULZE.

Locum Tenems: Catholic physician with knowledge of German for Minnesota country practice for eight weeks beginning February 1st. Give experience, age, nationality, etc. Address B-29 c/o Minnesota Medicine.

Locum Tenems: Physician to take my practice in town of 700 in Minnesota during February and March. Salary or percentage bases. Give age, experience and terms wanted. Address B-30 c/o Minnesota Medicine.

A-1 location for doctor and dentist; also chance to buy good paying drug store as side line. Address B-31 c/o Minnesota Medicine.

WANTED: Position in doctor's office, assistant, ten years experience. Reference. 1108 Eighth St. S. E., Minneapolis. Dinsmore 7664.